United States Court of Appeals

FOR THE EIGHTH CIRCUIT.

No. 17,441.

CIVIL.

JOHN DEERE COMPANY OF KANSAS CITY,
a Corporation and DEERE & COMPANY,
a Corporation,
Appellants,

vs.

WILLIAM T. GRAHAM, and GRAHAM PLOW, INC.,
Appellees.

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES
FOR THE WESTERN DISTRICT OF MISSOURI,
WESTERN DIVISION.

INDEX

Volume III—Exhibits

Plaintiffs' Exhibit A, Graham Patent No. 2,627,798 577
Plaintiffs' Exhibit K, Pamphlet of the Deere 900 Series 589
Plaintiffs' Exhibit O, File Wrapper and Contents of Patent 2,739,518 Granted March 27, 1956, to Elmer A. Rolf 593
Plaintiffs' Exhibit P, Soft Copy of the Rolf Patent No. 2,739,518 629
Plaintiffs' Exhibit Q, Opinion Letter of Judge Jos. B. Dooley, Order, Findings of Fact, Conclusions of Law and Judgment 633

Plaintiffs' Exhibit R, Sectional View of the 798 Clamp in the Static Position 643
Plaintiffs' Exhibit S, 798 Clamp at the Full Deflection Position of the Spring 645
Plaintiffs' Exhibit T, Showing Deflection of the Shank Between the Two Points of Support by Dotted Line Drawn Down Below the Bottom of the Shank and at Top of Shank 647
Plaintiffs' Exhibit U, Sectional View of the Changed 798 Clamp with the Hinged Member Inverted 649
Plaintiffs' Exhibit V, Clamp under Stress Position and Fully Depressed 651
Plaintiffs' Exhibit W, Dotted Line Showing the Flexing of the Shank 653
Defendants' Exhibit 1-A, Colored Drawing of the Cockshutt Clamp 655
Defendants' Exhibit 1-B, Colored Drawing of the Cockshutt Clamp 657
Defendants' Exhibit 4, File History of the Patent 798 659
Defendants' Exhibit 5, Book of Prior Art Patents 705
Defendants' Exhibit 7, Hypothetical General Claim 795
Defendants' Exhibit 8A, Claim 1 from 798 File Wrapper 796
Defendants' Exhibit 8D, Claim 7 from the 798 File History 797

Volume IV—Exhibits

Defendants' Exhibit 30, "No. 600 Tool Carrier Survey" by E. H. Lee, March, 1953, Product Research Department Copy 799
Defendants' Exhibit 31, "No. 600 Tool Carrier Survey" by E. H. Lee, April, 1953, Product Research Department Copy 823
Defendants' Exhibit 32, Correspondence Produced During the Taking of Depositions of the Employees at Moline, Illinois, of Deere & Company 844
Defendants' Exhibit 33-A, Drawing XCA-318-N 877
Defendants' Exhibit 33-B, Drawing XCA-318 879
Defendants' Exhibit 34-A, Drawing Attached to Letter of October 23, 1953, Part of Correspondence with Exhibit 32 881
Defendants' Exhibit 34-B, Another Drawing Attached to Same Letter 883
Defendants' Exhibit 38, Drawing XCL-134-N 885
Defendants' Exhibit 39, Drawing XCL-135-N 887
Defendants' Exhibit 41, Drawing Attached to Letter in Correspondence, Letter Being Dated December 8, 1953 889
Defendants' Exhibit 44, Copy of the Hunter Patent, No. 2,777,378 891
Defendants' Exhibit No. 45-A, Drawing of the Fixed Member 895
Defendants' Exhibit No. 45-B, Drawing of the Pivoted Member 897
Defendants' Exhibit 46, Drawing of Final Production Model of the 100 Series 899

Defendants' Exhibit 52-A, Photograph of a Part of the Test Setup 901
Defendants' Exhibit 52-B, Photograph of a Part of the Test Setup 901
Defendants' Exhibit 52-C, Photograph of a Part of the Test Setup 903
Defendants' Exhibit 52-D, Photograph of a Part of the Test Setup 903
Defendants' Exhibit 53, Judge Dooley's Letter Opinion Dated September 9, 1953, in Civil Action No. 1469 in the United States District Court for the Northern District of Texas, Amarillo Division, Styled Jeoffroy Manufacturing, Inc., v. Graham 905
Defendants' Exhibit 54, Judge Dooley's Letter Opinion to Counsel in the Same Case Dated December 18, 1953 916

PLAINTIFFS' EXHIBIT A

Plt. Ex. A

577

Feb. 10, 1953 W. T. GRAHAM 2,627,798

CLAMP FOR VIBRATING SHANK PLOWS

Filed Aug. 27, 1951 4 Sheets-Sheet 1

Fig. 1.

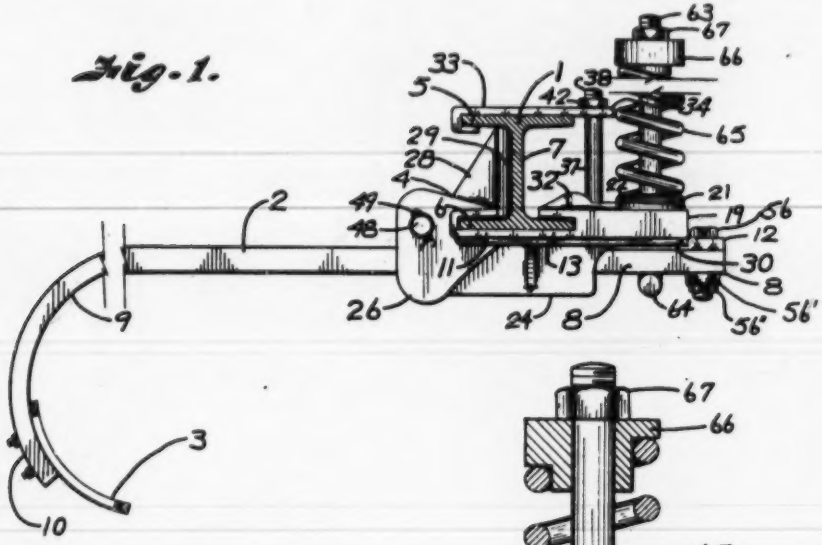
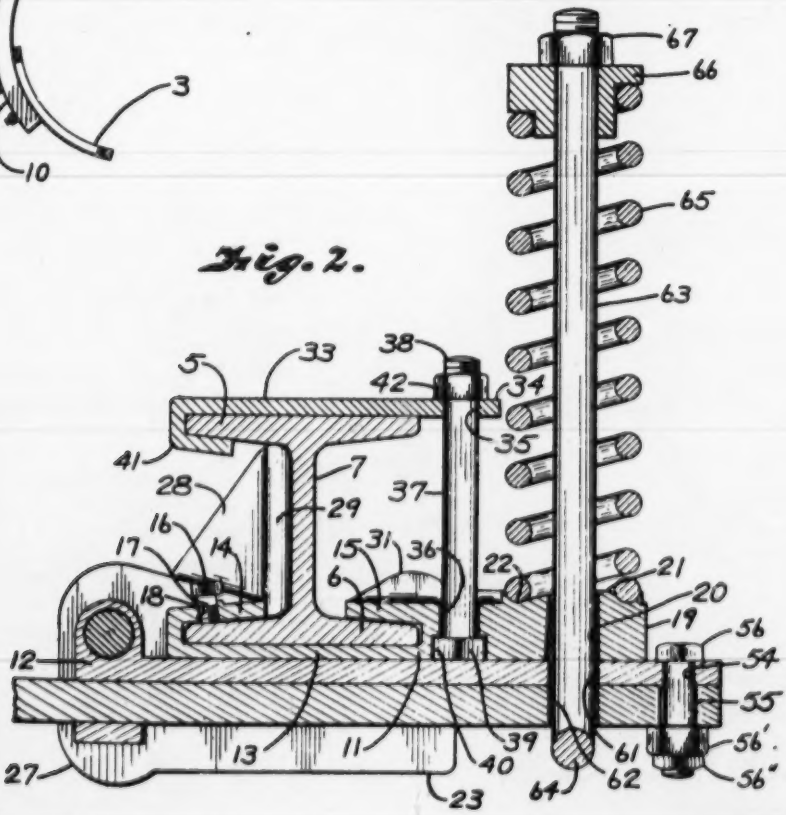


Fig. 2.



INVENTOR.
William T. Graham.
BY
Fishburn & Mullendore

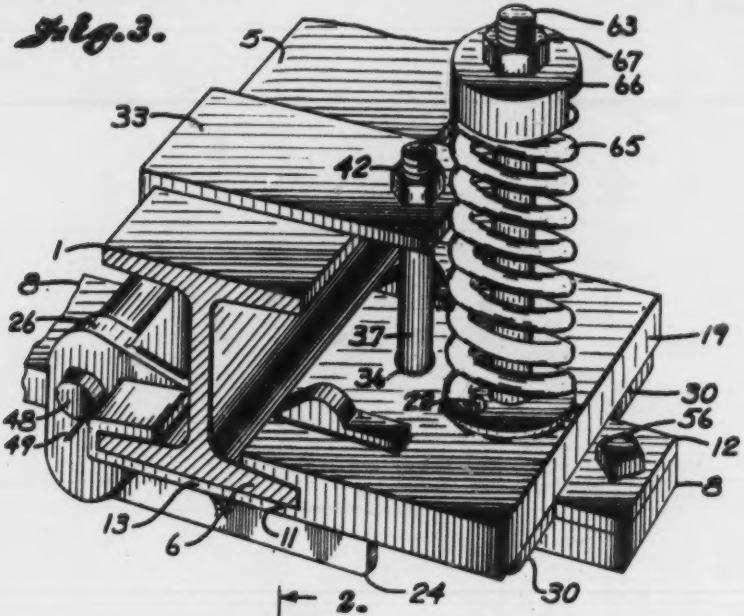
579

Feb. 10, 1953 W. T. GRAHAM 2,627,798

CLAMP FOR VIBRATING SHANK PLOWS

Filed Aug. 27, 1951 4 Sheets-Sheet 2

Fig. 3.



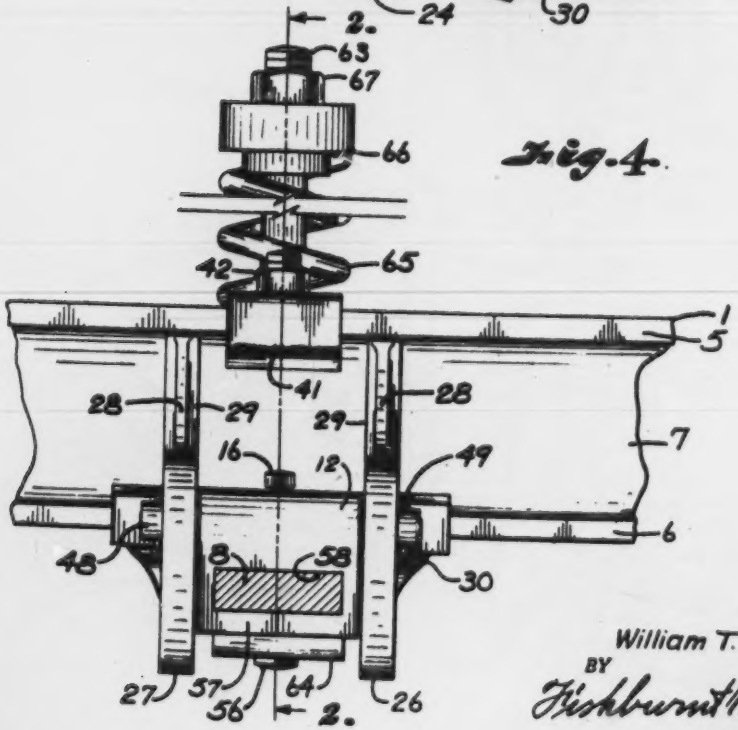


Fig. 4.

INVENTOR.
William T. Graham.
BY
Fishburn & Mullendore
ATTORNEYS.

581

Feb. 10, 1953 W. T. GRAHAM 2,627,798

CLAMP FOR VIBRATING SHANK PLOWS

Filed Aug. 27, 1951 4 Sheets-Sheet 3

Fig. 5.

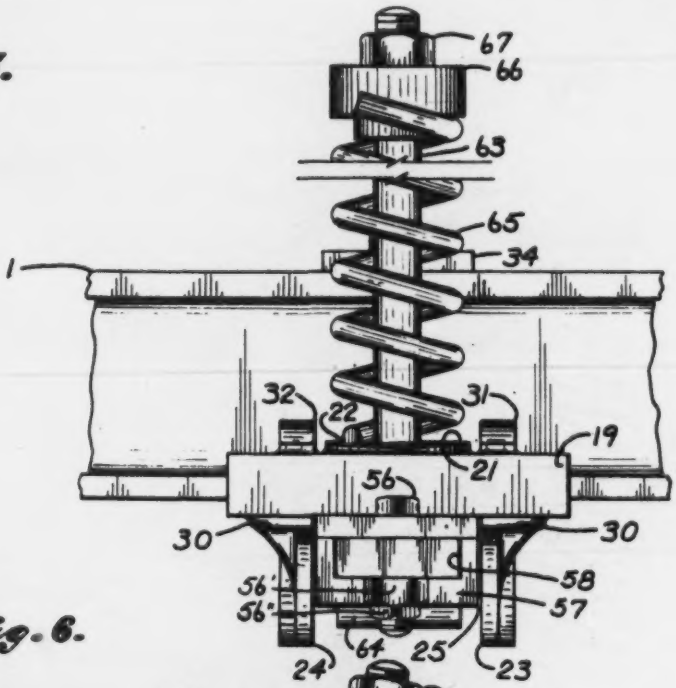
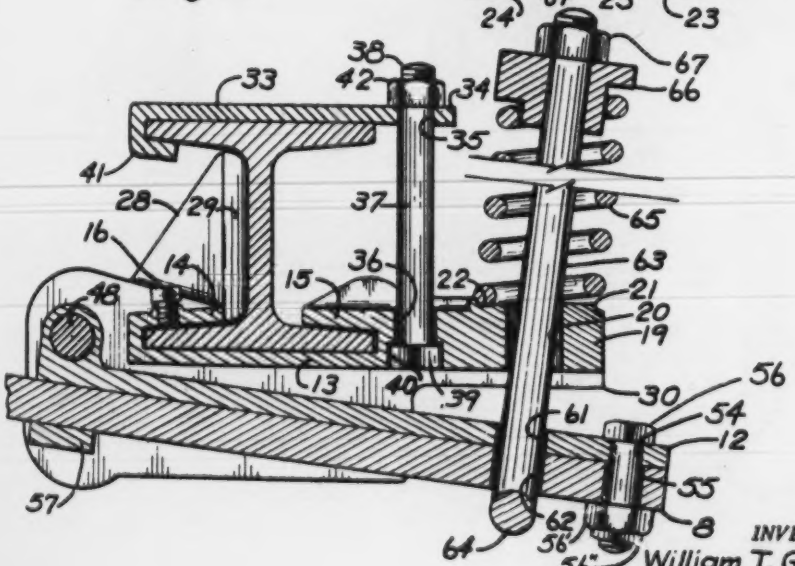


Fig. 6.



INVENTOR.
William T. Graham.

BY
Fishburn & Mullendore

ATTORNEYS.

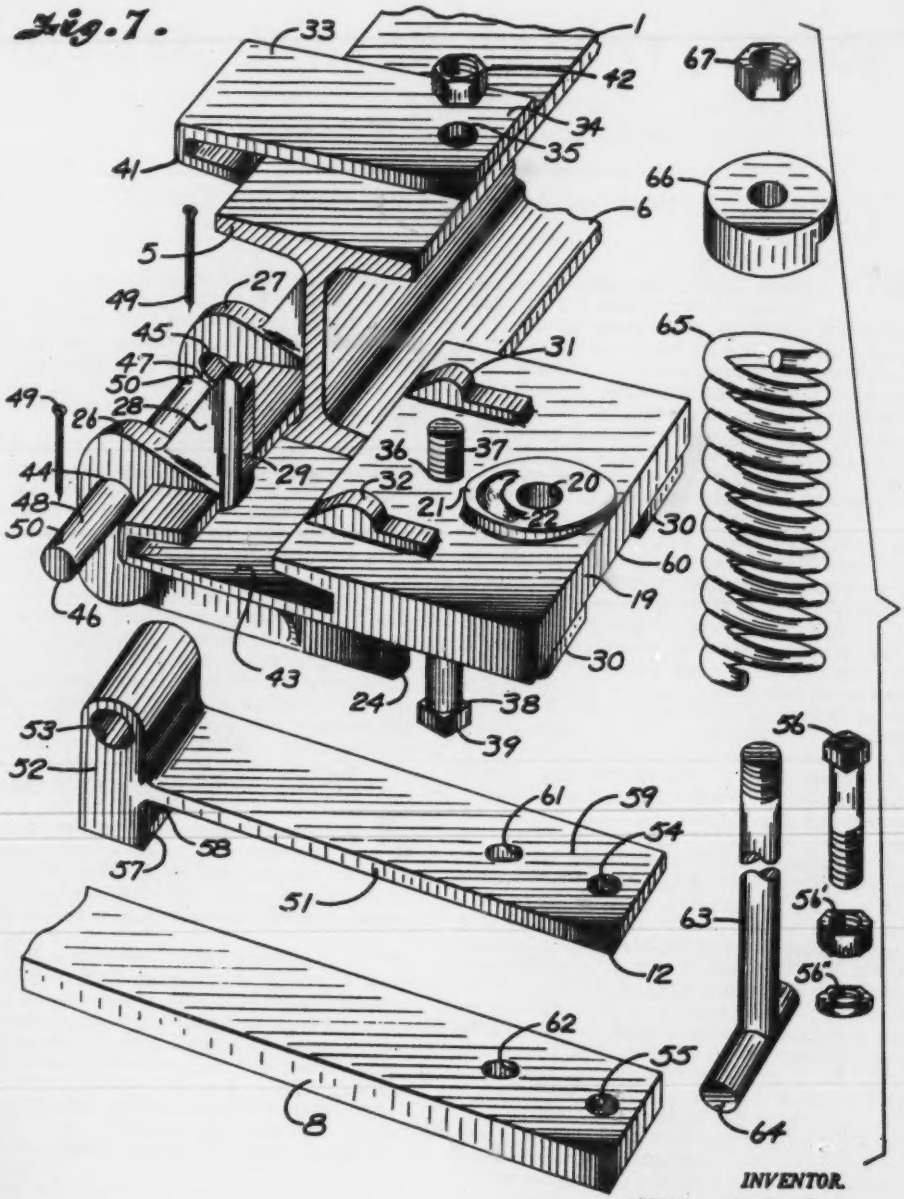
5-83

Feb. 10, 1953 W. T. GRAHAM 2,627,798

CLAMP FOR VIBRATING SHANK PLOWS

Filed Aug. 27. 1951 4 Sheets-Sheet 4

Fig. 7.



INVENTOR.
William T. Graham.
BY
Fishburn & Mullendore
ATTORNEYS.

585

UNITED STATES PATENT OFFICE

2,627,798

CLAMP FOR VIBRATING SHANK PLOWS

William T. Graham, Amarillo, Tex.

Application August 27, 1951, Serial No. 243,893

2 Claims. (Cl. 97—184)

1

This invention relates to a plow of a type including ground conditioning tools that are carried on shanks having support on a mobile frame and which work under the surface to heave and break the soil and form alternate ridges and furrows having exposed surfaces composed of sod, straw and clods normally occurring on a field.

When the field contains rocks and other obstructions, it is desirable to mount the shanks of the ground working tools for rocking movement on the frame of the plow so that the ground working tools will pass freely over the obstructions and return to normal plowing position without injury to the plow.

It is therefore the principal object of the present invention to provide a simple and reliable mounting for attaching the shanks of the ground working tools to the mobile frame whereby the shanks may rock when necessary and vibrate under action when the plow is working in rocky and/or heavy soils. It is also an object of the invention to provide a mounting which includes a fixed part and a movable part pivotally connected with the fixed part and having a shank attaching portion to which the shank is rigidly secured and resiliently retained on the fixed part.

In accomplishing these and other objects of the invention hereinafter pointed out, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a vertical section through a frame member of a plow showing a mounting constructed in accordance with the present invention for resiliently attaching the shanks of the ground working tools whereby the shanks are adapted to rock relatively to the frame when passing over an obstruction and return to normal position after the obstruction has been passed.

Fig. 2 is an enlarged longitudinal section through the frame member, the plow shank and the mounting by which the shank is pivotally connected with the frame member and resiliently held in normal plowing position, the section being taken on the line 2—2 of Fig. 4.

Fig. 3 is a perspective view of the structure disclosed in Fig. 2.

Fig. 4 is a rear elevational view, with the shank being shown in cross section.

Fig. 5 is a front elevational view.

Fig. 6 is a longitudinal section similar to Fig. 2 but showing the shank and movable part of the mounting rocked relatively to the fixed part of the mounting.

Fig. 7 is a perspective view of the parts shown

2

in disconnected and spaced relation to better illustrate the construction thereof.

Referring more in detail to the drawings:

1 designates a part of a plow frame to which the shanks 2 of the ground working tools 3 are attached by mountings generally indicated 4 and constructed in accordance with the present invention. Since all of the tool, shank and mounting assemblies are of like construction, only one of them is illustrated and described, it being understood that the plow may include one or more of the ground working devices.

The frame member 1, which composes a part of a plow frame, is illustrated as comprising an I-beam having upper and lower horizontally arranged flanges 5 and 6 that are interconnected by a vertical web 7. The shank 2 is formed of metal bar stock of substantially rectangular cross section and is of a width and thickness to provide the necessary strength and a certain amount of resiliency. The bar stock is shaped to provide a substantially straight end portion 8 extending in the direction of travel of the machine and a rearwardly and downwardly curved portion 9 terminating in a forwardly curved end 10 to carry the ground working tool 3. The straight end 8 of the shank extends transversely with respect to the frame member 1 and is adapted to rock transversely relatively to travel of the plow.

Each mounting 4 includes a fixed part 11 and a movable part 12. The fixed part 11 has a substantially flat plate portion 13 substantially corresponding in length to the width of the lower flange 6 of the I-beam and which is closely engaged therewith by flanges 14 and 15 extending over the upper face of the lower flange 6, as best shown in Fig. 2. One of the flanges, for example the flange 14 preferably carries a set screw 16 that has its shank 17 threaded in an opening 18 of the flange to engage the upper face of the flange 6 and draw the plate portion 13 of the fixed part into engagement with the lower face of the flange and assure a firm connection with the I-beam.

Projecting forwardly from the plate portion 13 and flange 15 is a relatively thicker extension 19 provided with a slot-like opening 20 extending through a boss 21 that forms a spring seat 22. Depending from the under side of the plate portion 13 and extending forwardly of a portion of the extension 19 are flanges 23 and 24 spaced apart to form a downwardly opening channel or way 25 therebetween and in which the movable part 12 of the mounting is adapted to rock along with the forward end portion 8 of the shank 2. Projecting rearwardly from the spaced flanges

23 and 24 are ears 26 and 27 that extend upwardly over the flange 14 and carry webs 28 that support abutments 29 which engage the rear face of the I-beam web 7 for distributing forces acting on the shank to the upper portion of the I-beam. The under side of the plate extension 19 may be reinforced by bosses 30 that extend forwardly on opposite sides of the channel or way 25, as shown in Figs. 5 and 7. It is obvious that the flange 14 of the fixed part is reinforced by the ears and webs 28. To reinforce the forward flange 15 the upper face of that flange and the extension 19 may be provided with spaced ribs 31 and 32, as best shown in Fig. 7.

In order to further attach the fixed part to the I-beam, the mounting may include a hook member 33 having a plate portion 34 that extends over the upper face of the upper I-beam flange 5 and which has an opening 35 aligning with an opening 36 in the forward extension of the fixed part to pass the shank 37 of a bolt 38, the head 39 of the bolt being countersunk within a recess 40 that is formed on the under face of the extension 19, as best shown in Figs. 2 and 6. The opposite end of the plate portion 33 has a downwardly and forwardly extending hook 41 that engages under the upper flange of the I-beam. The bolt 38 has a nut 42 threaded on the shank thereof to draw the parts tightly against the I-beam as shown in Figs. 2 and 6.

The ears 26 and 27 are provided above the level of the underface 43 of the plate portion 13 with registering openings 44 and 45 to mount the ends 46 and 47 of a transverse pin 48, the pin being retained in position by cotter pins 49 extending through suitable openings 50 in the projecting ends of the pin.

The movable part 12 includes an elongated plate portion 51 having a width to move freely within the channel or way 25 and the rear end has an upwardly extending transverse ear 52 that is provided with an opening 53 for passing the pin 48 to pivotally connect the movable part 12 with the fixed part 11. The plate portion 51 extends forwardly of the way and beyond the forward end of the extension 19 to accommodate an opening 54 that registers with a corresponding but slightly larger opening 55 in the end portion 8 of the shank 2 to pass a fastening device 56. The movable part also includes a depending loop 57 having a rectangular passageway 58 substantially conforming to the cross sectional shape of the end portion of the shank whereby the end portion 8 of the shank is passed therethrough and embraced by the loop portion to rock with the movable part on the pivot pin 48. The nut 56' of the bolt may be set up snug but is left sufficiently loose to permit slight longitudinal movement of the end portion of the shank relatively to the pivotal part of the clamp. The nut 56' is backed by a jam nut 56'' to prevent turning thereof after the nut 56' has been set.

The plow shank and movable part 12 of the mounting are resiliently retained in normal position with the upper face 59 of the plate portion 51 in clamping engagement with the under face 60 of the fixed part 11. This is effected by a resilient connection as now to be described. The end portion 8 of the shank and plate portion 51 of the movable part have elongated openings 61 and 62 that register with the slot-like opening 20 of the fixed part, as shown in Fig. 2. Extending through the registering openings 60, 61 and 20 is a rod 63 having a transverse head 64 on its lower end engaging under the end portion 8 of

the plow shank. Sleeved over the rod and having one end engaging the spring seat 22 is a coil spring 65 having its upper end connected with the upper end of the rod by a washer-like spring seat 66 retained on the upper end of the rod by a nut 67, the nut being tightened on the rod to compress the spring 65 sufficiently to retain the shank 2 and movable part 12 in normal position but to allow rocking movement of the movable part when the shank is rocked. This rocking movement of the shank will cause the movable part 12 to pivot away from the fixed part 11 along with the forward end portion 8 of the shank 2 to effect compression of the spring 65 so that the stored up action in the spring will return the shank and movable part of the clamp to normal position with the plate portion 51 resiliently clamped against the fixed part 11 of the mounting as shown in Fig. 2.

In assembling the mounting, the fixed part 11 is slid over an end of the I-beam 1 and moved to the desired location thereon along with other of the mountings not shown. The hook member 33 is then placed over the upper flange 5 of the I-beam with the hook 41 engaged with the flange after which the bolt 38 is applied and the nut 42 tightened to draw the fixed part 11 tightly against the lower flange 6 of the I-beam. The set screw 16 may then be tightened to further secure the fixed part of the mounting. The end portion 8 of the plow shank 2 is then passed through the opening 57 of the loop portion of the movable part 12 until the opening 55 registers with the opening 54. The fastening device 56 is then inserted through the registering openings 54 and 55 to secure the shank to the movable part of the mounting. The movable part 12 and forward end 8 of the shank are then placed within the downwardly opening way 25 of the fixed part 11 and the pivot pin 48 is passed through the openings 44, 45 and 53 in the registering ears 26, 27 and 52 after which the cotter pins 49 are inserted in the openings 50.

The rod 63 is then passed through the openings 61, 62, and 20 and the coil spring 65 is sleeved thereover to engage the seat 22. The spring seat 66 is then applied over the upper threaded end of the rod to engage the upper end of the spring after which the nut 67 is applied to compress the spring and draw the movable part 12 into clamping engagement with the fixed part 11, sufficient tension having been applied to normally retain the shank and tool 3 in plowing position.

When the plow is in operation the ground working tool 3 may engage an obstruction. However, the tool is free to ride over the top of the obstruction upon upward rocking movement of the shank 2, the shank moving with the movable part 12 of the mounting about the axis of the pivot pin 48 so that the forward end 8 of the shank moves downwardly to cause the rod 63 to further compress the spring 65 whereby the spring 65 is enabled to return the shank 2 and movable part 12 to their normal position after the ground working tool has passed over the obstruction.

During operation of the plow, there is also a vibratory or pumping movement of the ground working tool that acts to reduce the draft and facilitate operation of the ground working tool in plowing up and heaving the soil to form the ridges and furrows. The pumping action of the ground working tools work the fine soil downwardly to form the seed bed and the larger clods, straw and the other mulching materials are

worked to the surface for covering the fine soil and serving as a mulch to preserve the moisture.

From the foregoing it is obvious that I have provided a plow structure wherein the shanks of the ground working tools are attached to the plow frame in a manner to permit the desired rocking action of the plow shanks in a simple and efficient manner and without producing destructive strains on the plow frame or excessive wear on the mounting parts.

What I claim and desire to secure by Letters Patent is:

1. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for pivotally attaching and supporting the shank of the ground working tool to a transverse member of the frame, the mounting including a fixed member adapted to be fixed to the transverse member of the frame and having a longitudinally extending underface terminating forwardly of the transverse member to which said mounting is adapted to be fixed, the fixed member having ears extending rearwardly from said underface at the sides thereof, a shank attaching member having an elongated plate portion provided with an upper face corresponding with and normally in contact with said underface of the fixed member and provided with a longitudinally extending underface in engagement with a corresponding upper face of the shank whereby the plate portion of the shank attaching member is between the shank and the fixed member, means connecting the elongated plate portion with the shank for maintaining the upper face of the shank in constant continuous contact with the underface of said plate portion of the shank attaching member, a transverse pin pivotally connecting the shank attaching member to the fixed member at the rear ends of said normally contacting faces and whereon the shank attaching member pivots upon rocking movement of the shank, a coil spring having one end seated on the forward end of the fixed member, and means having connection with the forward end of the shank and with the other end of the coil spring whereby the spring yieldably maintains said normal contact of the upper face of the plate portion of the shank attaching member with the underface of the fixed member to maintain the normal plowing depth of the ground working tool.

2. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for pivotally attaching and supporting the shank of the ground working tool to a transverse member of the frame, the mounting including a fixed member adapted to be fixed to the transverse member of the frame and having a longitudinally extending underface terminating forwardly of the transverse member to which said mounting is adapted to be fixed, the fixed member having ears extending rearwardly from said underface at the sides thereof, a shank attaching member having an elongated plate portion provided with an upper face corresponding with and normally in contact with said underface of the fixed member and provided with a longitudinally extending underface in engagement with a corresponding upper face of the shank whereby the plate portion of the shank attaching member is between the shank and the fixed member, said shank attaching member having a lug extending upwardly between said ears of the fixed member and disposed at the rear end of the plate portion and above the plane of the underface of the fixed member, said shank attaching member having depending means embracing the shank at the rear end of said plate portion, a bolt connecting the forward end of the plate portion with the forward end of the shank and cooperating with the shank embracing means in maintaining the upper face of the shank in constant continuous contact with the underface of said plate portion, a pivot pin extending transversely through said lug and carried by the ears with the axis thereof above the plane of the underface of the fixed member whereby the normally contacting face of the shank attaching member immediately moves out of contact with and away from the face of the fixed member when the shank attaching member pivots upon rocking movement of the shank, a coil spring having one end seated on the forward end of the fixed member, and means having connection with the forward end of the shank and with the other end of the coil spring whereby the spring yieldably maintains said normal contact of the upper face of the plate portion of the shank attaching member with the underface of the fixed member.

WILLIAM T. GRAHAM.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
417,775	Drader et al.	Dec. 24, 1889
2,014,451	Pfeifer	Sept. 17, 1935
2,493,811	Graham	Jan. 10, 1950

FOREIGN PATENTS

Number	Country	Date
57,391	Denmark	Mar. 18, 1940
111,910	Australia	Nov. 8, 1940

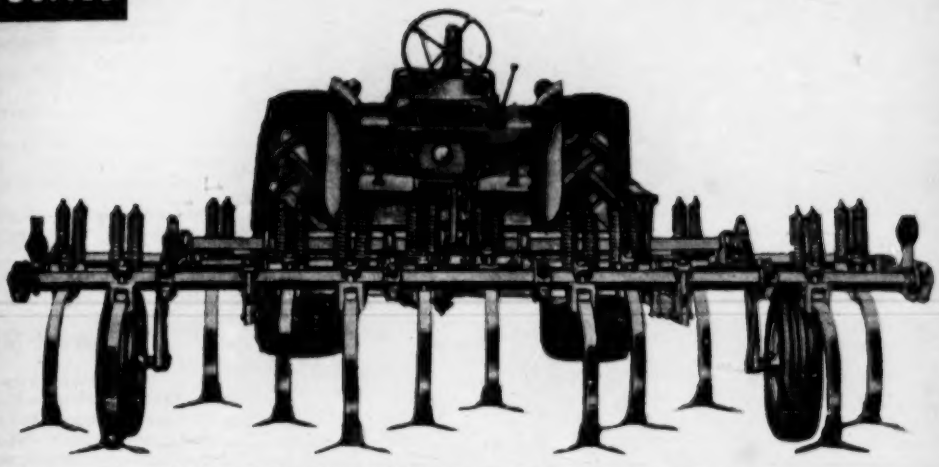
PLAINTIFFS' EXHIBIT K 589

FOR

PROFESSIONAL RESULTS

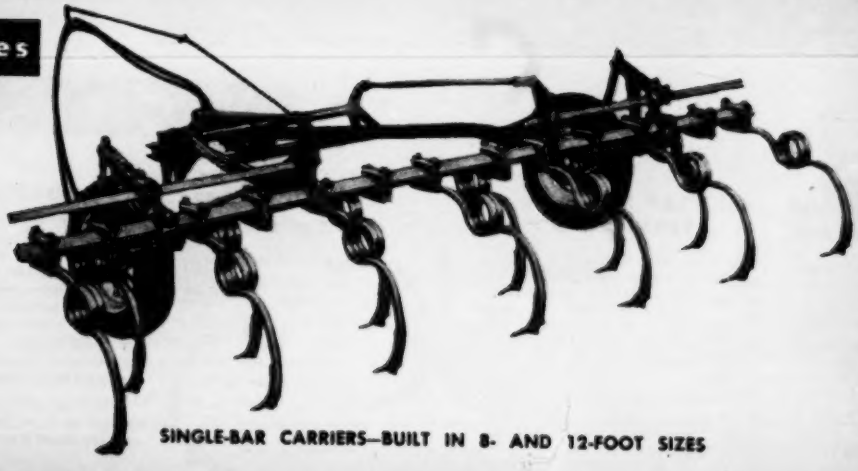
ON EVERY TILLAGE JOB . . .

No. 650 Series



2- OR 3-BAR CARRIERS—BUILT IN 12- AND 16-FOOT SIZES

o. 900 Series



SINGLE-BAR CARRIERS—BUILT IN 8- AND 12-FOOT SIZES

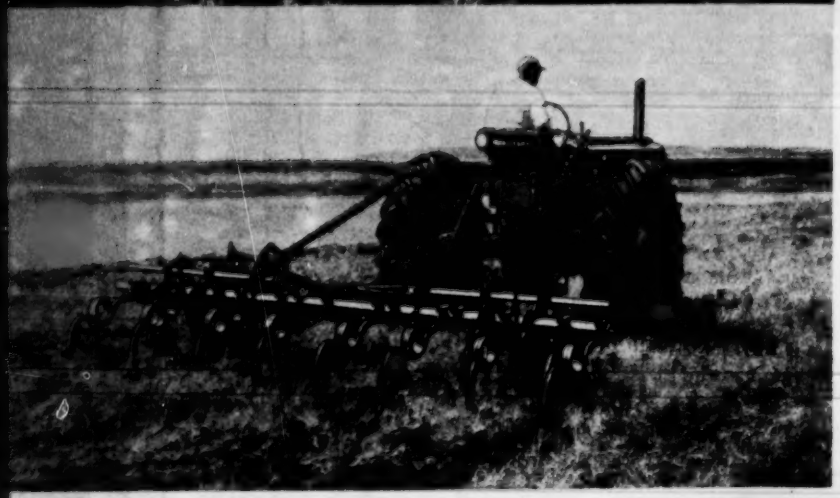
590

DO BETTER WORK...IN

CUT COSTS WITH A VERSATI

No. 650

Shown at left is the 16-foot John Deere No. 650 Tool Carrier equipped with hydraulic Power Trol and flat cushion spring standards. It's a rugged, big-capacity outfit with plenty of clearance for trashy conditions.



No. 900

Pictured at left is the single-bar 12-foot John Deere No. 900 Tool Carrier equipped with mechanical power lift and double-coil spring standards. It's also available for hydraulic operation or with hand lift.

COMPLETE WOR

FLAT SPRING STANDARDS

At Left: John Deere Flat Spring Standards or Cushion Spring Standards and stub bars are furnished in sets to create a 3-bar No. 650 Carrier with a diagonal tooth pattern. The cushion relief feature reduces breakage in rocky field conditions.

Working points include: 12-, 14-, and 16-inch chisels . . . 14- and 16-inch spikes . . . and 6- through 18-inch sweeps.

DOUBLE-COIL SPRING STANDARDS

At Left: John Deere Heavy-Duty, Double-Coil Spring Standards. Front- and rear-type standards are furnished in sets to provide 4 rows of standards on the two main frame bars. Clamps are Quik-Tatch for ease of handling. Double-Coil Spring Standards are made of heavy-duty 1-1 4-inch steel.

Working points include: 12-inch chisels or tool bar sweeps in sizes ranging from 6 to 14 inches.

591

CREASE CROP YIELDS...

JOHN DEERE TOOL CARRIER

HERE, with one implement, you can establish an entire tillage system that will increase crop yields through better work and soil conservation practices. Used throughout the entire working season, you have versatile tool that cuts the cost of tillage on every job.

Wide Variety of Jobs

Versatile John Deere Tool Carriers do outstanding rk on a wide variety of tillage jobs. They prepare seedbeds . . . kill weeds . . . work summer-fallow . . . till the subsurface . . . break the subsoil . . . rough up fields to reduce wind erosion . . . and renovate alfalfa or pasture land.

Along with these jobs you can use a John Deere Tool Carrier as an effective conservation implement. They conserve moisture and reduce wind and water erosion.

What's more, accurate planting attachments are available for planting corn or cotton. What more could you ask for in one implement?

Bring on your rough fields . . . your gumbo . . . your heavy stubble . . . your stony fields . . . your hard-baked soils . . . your tough pasture land—a rugged John Deere Tool Carrier is designed, built, and equipped to meet every condition. Their husky construction provides steady, dependable operation with minimum upkeep costs.

Increased Yields

Many farmers report increased yields by using a John Deere Tool Carrier along with other good soil conservation practices. A wide variety of Quik-Tatch working equipment permits maximum efficient use of a John Deere Carrier by adapting it to so many jobs.

On light tillage work, John Deere Carriers are equipped with either flat cushion spring standards, flat spring standards, or double-coil spring standards. Sweeps, chisels, and spikes, meet every ground-working requirement.

Equipped with "live-action," vibrating spring standards and sweeps your John Deere Carrier does a fast, clean job of killing quack grass, Russian thistle, water weeds, horsetail, and other tough weeds. You can prepare seedbeds in spring . . . work summer-fallow continuously . . . work up stubble fields . . . mulch stubble to absorb and hold moisture and reduce wind and water erosion . . . rough up fields to bring clods to the surface, sifting fine soil to the bottom to reduce blowing . . . and work up hard, baked fields after excessive rainfall.

With reversible chisels or spikes and spring standards you can break up shallow hardpan or renovate alfalfa or pasture.

Deep Work

Equipped with heavy-duty stiff standards and heavy reversible chisel points, John Deere Tool Carriers do an excellent job of subsoiling. By working around hills or slopes with this outfit you can open up the subsoil to retain water, providing a reservoir for the next crop. What's more, you control water runoff and provide a better rootbed for your crops. The number of chisels you use and depth of operation depend upon the tractor power available.

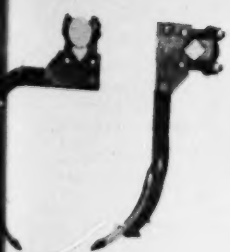
Subsurface Tillage

Equipped with stiff standards, 30-inch sweeps, and with rolling coulters where trash or stubble is heavy, John Deere Tool Carriers slice off weeds after they have gained a good growth but before they go to seed. This method kills all vegetation by cutting off feeder roots but leaves weeds and stubble trash "anchored" to the ground by the surface roots to reduce blowing. A heavy, dead mulch completely covers the ground, reducing moisture loss and holding rain or snow to penetrate where it falls. Water erosion is checked and valuable humus is added to the soil.

Quik-Tatch clamps which hold spring teeth and stiff standards to the bars make it a simple job to change from one tillage job to another or to change spacing of various tools along the tool bar. These Quik-Tatch clamps also make it easy to add or remove working attachments as field conditions require.

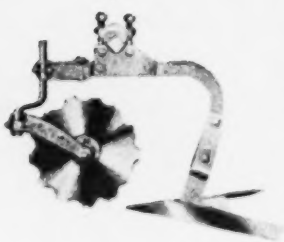
Get more details on the John Deere Tool Carrier you need on the inside page.

ING EQUIPMENT



STIFF STANDARDS

John Deere Stiff Standards are made of 1-1 4 x 2-1 4-inch heat-treated steel. You can work deep with these rugged, stiff standards. A complete line of working points is available on every job and field condition. Chisels in 12, 14, and 16 inches . . . 14- and 16-inch spikes . . . and sweeps from 6 to 18 inches are available.



SUBSURFACE STANDARDS

John Deere Subsurface Sweep Standards handle shallow work at depths to 6 inches. A friction trip release reduces possibility of damage when striking a stone or other obstruction. Greater fore-and-aft clearance is provided. These standards are equipped with 30-inch sweeps for use in 24-, 26- or 28-inch spacing. Notched or plain coulters are available for heavy trash conditions.

When you choose
the RIGHT TOOL...
...You'll do
the JOB RIGHT

PLAINTIFFS' EXHIBIT O

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE

To all persons to whom these presents shall come, Greeting:

THIS IS TO CERTIFY that the annexed is a true copy from the records of this office of the File Wrapper and Contents of Patent 2,739,518, granted March 27, 1956, to Elmer A. Rolf, assignor to Glencoe Manufacturing Company, for Shank Holder.

IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this thirtieth day of April, in the year of our Lord one thousand nine hundred and fifty-six and of the Independence of the United States of America the one hundred and eightieth.

/s/ Robert C. Watson
Commissioner of Patents.

Attest:

/s/ M. K. Hansen
Certifying Officer
(Seal)

PATENT No. 2739518

Dated Mar. 27, 1956

NUMBER (Series of 1948)
283174
DIV. X Class IV

Division of App., No. _____, filed _____, 19____ Patent No. _____ Granted _____, 19____

Name Elmer A. Rolf, Assessor to Glencoe Manufacturing Company, Glencoe, Minnesota, a Corporation of Minnesota, of Glencoe, State of Minnesota, Invention Shank Holder.

Title Approved
/s/MPS
Examiner

Original

APPLICATION FILED COMPLETE, April 19, 1952
185717

Parts of Application Filed

Petition, Specification, Oath, First Fee $30 1 sheets Drawings,	April 19, 1952

Examined and passed for Issue August 22, 1955. M. P. Smith, Exr. Class. Div. IV.

Notice of Allowance August 24, 1955, by Commissioner.

Final Fee $30.00 February 21, 1956.

Attorney Williamson, Williamson, Schroeder & Adams, 950 Pillsbury Bldg., Minneapolis, Minnesota.
Associate Attorney

No. of Claims Allowed 2 Print Claims 1 in O.G. Class 97-47-84.

This invention relates to shank holders for holding the shanks of agricultural implements and the like. More particularly, it relates to shank holders for holding the shank of an agricultural implement or the like which is constantly urged into ground-engaging relation and which must necessarily be able to rock or pivot at its forward end to permit the implement to yield when exceptionally heavy obstructions are met.

It is a general object of my invention to provide a novel and improved shank holder of cheap and simple construction.

Another object is to provide a novel and improved shank holder upon which the shank may be quickly and simply mounted.

Another object is to provide a shank holder adapted to be pivotally mounted for use in conjunction with an upright upwardly urged tension rod at its forward end and having its forward end portions so constructed as to facilitate such pivotal movement.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

Fig. 1 is a side elevational view of one embodiment of my invention used in conjunction with a pair of mounting members which secure the ground implement to a cross member of an agricultural machine;

Fig. 2 is a top plan view of my shank holder;

Fig. 3 is a longitudinal sectional view of the same; and

Fig. 4 is a transverse vertical sectional view taken approximately along line 4-4 of Fig. 3.

One embodiment of my invention is shown in Fig. 1 pivotally mounted upon a pair of mounting members indicated generally as A and B. These mounting members positively engage the cross member C of the agricultural machine. As shown, the mounting member A has a channel element 5 and a pair of depending webs 6 which extend downwardly from its opposite sides and each of which has a transversely extending aperture 7 formed therethrough. These apertures carry pivot pin 8 which extends thereacross and therethrough to provide a pivotal axis for the shank holder which embodies my invention. The other mounting member B has a channel member 9 which engages the cross member C and a pair of spaced generally triangularly shaped side portions 10 which extend vertically and forwardly with respect to the cross member C. Each of the side portions 10 has a groove or recess 11 adapted to receive therein the ears 12 of a collar 13 which is slidably mounted upon an upright tension rod 14. The tension rod 14 is threaded at its lower end and carries a washer 15 and a nut 16 thereupon. Mounted on the upper end portion of the tension rod 14 is a compression spring 17 the lower end of which abuts against the collar 13 and the upper end of which abuts against the broad end portion 18 of the tension rod. The compression spring 17 continuously urges the collar 13 downwardly and resists any attempt to draw the tension rod 14 further downwardly. The two mounting members A and B are held together by bolts D so that the channel mem-

bers 5 and 9 will positively engage the cross member C and provide a rigid mounting for the shank holder shown.

The structure recited above is utilized in conjunction with my shank holder to mount a shank 19 and an agricultural implement 20, which it carries, upon the cross member C.

Figs. 2, 3 and 4 show in greater detail the shank holder which embodies my invention. As shown, it includes a rigid elongated bar 21 which has a forward end portion 22, a rearward end portion 23, and a medial portion 24. Along its side edges is a pair of spaced and oppositely depending webs 25 and 26 which extend longitudinally of the bar 21 and have oppositely disposed apertures 27 formed therethrough, these apertures extending transversely of the bar 21 and being adapted to receive the pivot pin 8 which extends through the lower end portion of the mounting member A. A sleeve element 28 having the same internal bore as the apertures 27 connects the two side webs 25 and 26 to provide a pivotal bearing for the bar 21.

Mounted upon the upper surface of the bar 21 and extending upwardly therefrom is a longitudinally extending sleeve element 29, the bore 30 of which is of such size as to readily receive the shank 19 therethrough so that the shank will extend longitudinally of the bar 21. Formed through the bar 21 on the opposite side of the sleeve 28 with respect to the sleeve 29 is a vertically extending aperture 31 adapted to receive a bolt 32 which rigidly affixes the forward end of the shank 19 to the bar 21 at that point.

The forward end portion 22 of the bar 21 is vertically apertured as at 33 and has a lower surface 34 which is shaped convexly and which functions as an abutment surface for the washer 15 and is urged upwardly by the spring 17 and the nut 16. The bore of the aperture 33 is such that the portion of the bar 21 which forms the rear wall 35 of the aperture slopes upwardly and rearwardly as best shown in Fig. 3. The aperture 33 itself is of greater dimensions longitudinally of the bar than transversely as is best shown in Fig. 2.

Mounted on the upper surface of the bar 21 and extending upwardly therefrom is an abutment shoulder 36 which

is positioned between the aperture 31 and the aperture 33. This abutment shoulder 36 when the entire unit is assembled abuts against the lower end portion of the mounting member B to prevent the upper surface of the forward end portion of the plate 21 from pivoting to a position above horizontal.

In operation, the shank holder is mounted upon the mounting members A and B in the manner shown in Fig. 1 with the shank slid from the rear through the sleeve 29 and affixed by the bolt 32 to the portion of the bar forward of the transverse sleeve 28. The shank holder is pivotally mounted between the depending webs 29 of the mounting member A by slipping the pivot pin 8 through the aperture 7 of the web and through the sleeve 28. The tension rod 14 is then inserted through the aperture 33 and the washer 15 and the nut 16 threaded onto the lower end portion of the tension rod 14 so that the washer 15 will abut against the abutment surface 34 of the forward end portion of the shank holder.

As the agricultural machine (not shown) is drawn forwardly the implement 20 is maintained in ground-engaging position by the upward urging upon the forward end portion of the shank holder which is exerted by the tension rod 14 and the spring 17. Whenever an obstacle is encountered or a particularly hard area of ground is engaged the implement tends to raise upwardly and the shank and the shank holder pivot about the pivot pin 8 with the forward end portion 22 of the shank holder moving downwardly in the direction shown by the arrow in Fig. 1. As this takes place the angle between the top surface of the bar 21 and the tension rod 14 changes and the tension rod 14 moves over toward the rearwardly sloping near wall portions 35 of the aperture 33. At the same time the washer 15 slides easily forwardly around the convexly shaped abutment surface 34. By so constructing my shank holder the pivotal movement of the same is unobstructed and unhindered except for the upward urging of the spring 17. Thus my shank holder makes it possible to provide a truly pivotal mounting for the forward end of the shank 19 and places a much lesser strain upon the implement 20 itself which in the past has fre-

quently resulted in undue and unnecessary breakage of the implement.

Thus it can be seen that I have provided a novel and improved shank holder of extremely simple and cheap construction. It can be readily seen that my shank holder is constructed so as to provide the maximum in freedom of pivotal movement of the same so that no undue strain is placed upon any part of the mounting or holder for the shank. The freedom of movement provided by the rearwardly extending walls 35 of the aperture 33 and the pivotal mounting of the tension rod 14 provided by the ears 12 of the collar 13 and the grooves 11 makes it possible for the rear end portion of the shank 19 to raise to any level which may ordinarily be required in ground-working operations.

It will of course be understood that various changes may be made in the form, details, arrangement, and proportions of the various parts without departing from the scope of my invention.

WHAT IS CLAIMED IS:

1. A shank holder comprising a rigid elongated bar, means for rigidly connecting the shank to the rearward end portion of said bar to extend longitudinally thereof, a transversely extending sleeve element mounted upon the medial portion of said bar and adapted to pivotally connect the holder to an implement mounting for pivotal movement relative thereto, said bar having an aperture formed at its forward end portion for receiving therethrough an upright upwardly and resiliently urged tension rod having a washer and nut at its lower end for abutment against the lower surface of said forward end portion, the lower surface of the forward end portion of said bar surrounding said aperture being convexly shaped to facilitate the pivotal movement of the holder relative to the mounting while the forward portion thereof is urged upwardly by the washer and nut on the tension rod.

2. A shank mounting having in combination a rigid elongated bar, an upstanding sleeve element mounted upon the rearward end portion of said bar with the opening of said sleeve element extending longitudinally of said bar

to accommodate a shank therewithin and to facilitate the connection of the shank to said bar, and a transversely extending sleeve element mounted upon the medial portion of said bar and adapted to pivotally connect the bar to an implement mounting for pivotal movement relative thereto, said bar having an aperture formed in its forward end portion, a vertically movable upwardly and resiliently urged tension rod extending through said aperture and having a washer and nut at its lower end for abutment against the lower surface of said forward end portion, the lower surface of the forward end portion of said bar surrounding said aperture being convexly shaped to facilitate the pivotal movement of said bar relative to the mounting while the forward portion thereof is urged upwardly by the washer and nut on the tension rod.

3. A shank holder comprising a rigid elongated bar, means for rigidly connecting the shank to the rearward end portion of said bar, a transversely extending sleeve element mounted upon the lower side of the medial portion of said bar and adapted to pivotally connect the holder to an implement mounting for pivotal movement relative thereto, said bar having an aperture formed in its forward end portion for receiving therethrough an upright upwardly and resiliently urged tension rod having a washer and nut at its lower end for abutment against the lower surface of said forward end portion, the lower surface of the forward end portion of said bar surrounding said aperture being convexly shaped to facilitate the pivotal movement of the holder relative to the mounting while the forward portion thereof is urged upwardly by the washer and nut on the tension rod, the aperture in the forward end portion of said bar being of greater dimensions longitudinally than transversely of the bar to facilitate the pivotal movement of the holder.

4. A shank holder for pivotally securing a shank to an implement mounting which has a pair of transversely apertured downwardly extending webs and a pivot pin in such apertures, said holder comprising a rigid elongated body having an upstanding sleeve at its rearward end extending longitudinally of said body and having a transverse sleeve at its intermediate portion of lesser length

than the spacing between the implement mounting webs to permit the same to be pivotally mounted therebetween, and having a forward end portion vertically apertured to permit an upright upwardly urged tension rod to extend therethrough and to be connected thereto by a washer and nut at the lower end of the rod, the forward end portion of said body having a lower abutment surface shaped convexly to facilitate the movement of such washer relative thereto while the holder pivots relative to its mounting.

5. A shank holder comprising a rigid elongated bar, means for rigidly connecting the shank to the rearward end portion of said bar so as to extend rearwardly therefrom, a transversely extending sleeve element mounted upon the medial portion of said bar and adapted to pivotally connect the holder to an implement mounting for pivotal movement relative thereto about an axis transverse to the direction of movement of the implement, said bar having an aperture formed in its forward end portion for receiving therethrough an upright upwardly and resiliently urged tension rod having a washer and nut at its lower end for abutment against the lower surface of said forward end portion, the portions of said bar which define the rearward walls of the aperture in said forward end portion of said bar extending diagonally upwardly and rearwardly from the lower surface of said forward end portion to permit the tension rod to remain in an upright position despite downward movement of said forward end portion during the pivotal movement of the holder.

6. A shank holder comprising a rigid elongated bar, an upstanding sleeve element mounted upon the rearward end portion of said bar with the opening of said sleeve element extending longitudinally of said bar to accommodate a shank therewithin and to facilitate the connection of the shank to the bar, and a transversely extending sleeve element mounted upon the medial portion of said bar and adapted to pivotally connect the holder to an implement mounting for pivotal movement relative thereto, said bar having an aperture formed in its forward end portion for receiving therethrough an upright upwardly

and resiliently urged tension rod having a washer and nut at its lower end for abutment against the lower surface of said forward end portion, the lower surface of the forward end portion of said bar surrounding said aperture being convexly shaped to facilitate the movement of such washer relative thereto while the holder pivots relative to its mounting and the forward portion of said bar is urged upwardly by the washer and nut on the tension rod, the aperture in said forward end portion of said bar being of longer dimensions longitudinally of the bar than transversely thereto and having its rearward-most walls sloping upwardly and rearwardly to facilitate unhindered pivotal movement of the shank holder except for the upward urging of the tension rod.

7. The structure defined in Claim 6, and an upwardly extending abutment shoulder mounted on the upper surface of said bar intermediate said transverse sleeve element and said aperture for abutment against the mounting to which the holder is connected to prevent the forward end portion of said bar to move upwardly beyond horizontal position.

OATH, POWER OF ATTORNEY, AND PETITION

Being duly sworn I (XX) Elmer A. Rolf, depose and say that I am a citizen of the United States of America, residing at Glencoe, Minnesota, that I have read the foregoing specifications and claims and I verily believe I am the original, first and sole inventor of the invention or discovery in SHANK HOLDER, described and claimed herein: that I do not know and do not believe that this invention was ever known or used before my invention or discovery thereof, or patented or described in any printed publication in any country before my invention or discovery thereof, or more than one year prior to this application, or in public use or on sale in the United States for more than one year prior to this application; that this invention or discovery has not been patented in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months before this application; and that no application for patent

on this invention or discovery has been filed by me or my representatives or assigns in any country foreign to the United States, except as follows:

— No exceptions —

And I hereby appoint WILLIAMSON, WILLIAMSON, SCHROEDER & ADAMS, 950 Pillsbury Building, Minneapolis, Minnesota, Registration No. 12984, my attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent Office connected therewith.

Wherefore I pray that Letters Patent, be granted to me for the invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification and claims, oath, power of attorney, and this petition.

	First name	Middle initial	Last name
INVENTOR	Elmer	A.	Rolf

Post Office Address Glencoe, Minn.

INVENTOR _____

	First name	Middle initial	Last name

Post Office Address _____

_____

State of MINNESOTA)
) ss.
County of MCLEOD)

Before me personally appeared Elmer A. Rolf, to me known to be the person described in the above application for patent, who signed the foregoing instrument in my presence, and made oath before me to the allegations

set forth therein as being under oath, on the 2nd day of April, 1952.

/s/ Frank J. Heaney
Notary Public

(Seal)

My Commission Expires Sept. 5, 1956

WILLIAMSON, WILLIAMSON, SCHROEDER & ADAMS
Registration No. 12984

97
47.84

Aug 24, 55

605

283174 # 2

Pat. No. 2,739,518

PRINT OF DRAWING AS ORIGINALLY FILED

FIG. 2

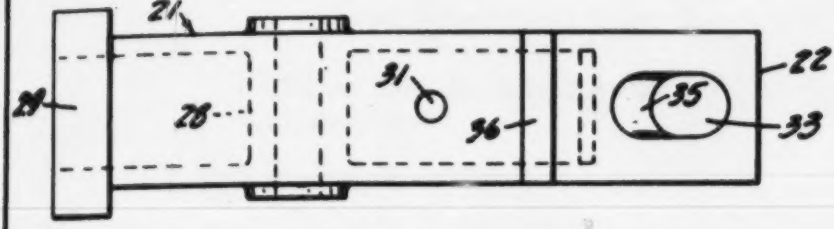


FIG. 3

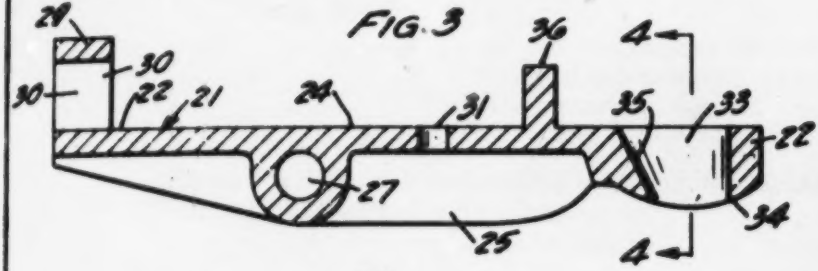


FIG. 1

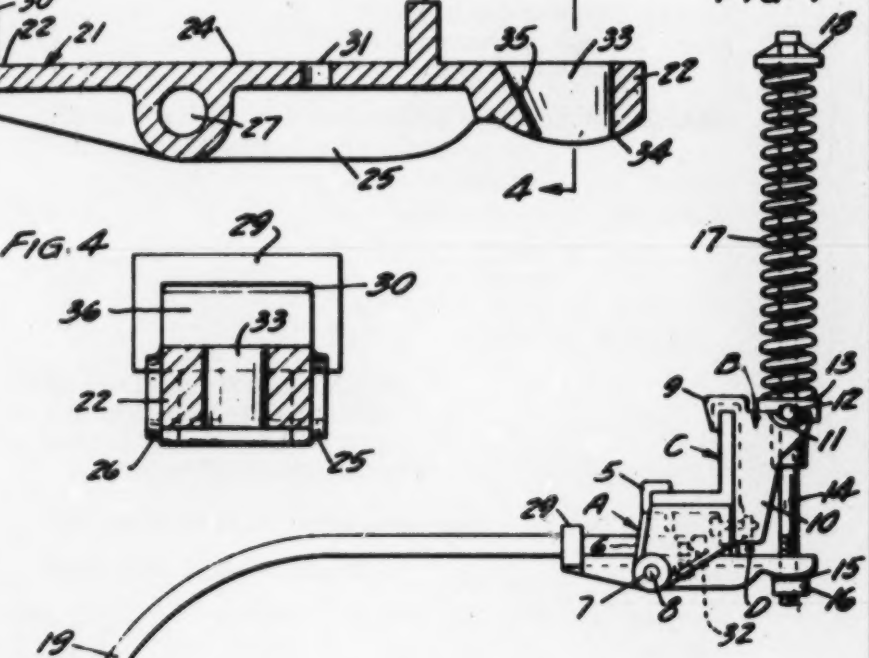


FIG. 4

INVENTOR
ELMER A. ROLF

By Williamson, Williamson, Schroeder & Adams
ATTORNEYS

DEPARTMENT OF COMMERCE
United States Patent Office
Washington

(Mailed Nov. 25, 1952, Pat. Div. 1)
Address Only

The Commissioner of Patents
Washington 25, D. C.

Paper No. 3

All communications respecting this application should give the serial number, date of filing, and name of the applicant.

Please find below a communication from the EXAMINER in charge of this application.

/s/ John A. Marzall
Commissioner of Patents.

Applicant: Elmer A. Rolf
Ser. No. 283,174
Filed April 19, 1952
For SHANK HOLDER

WILLIAMSON, WILLIAMSON,
SCHROEDER AND ADAMS
950 PILLSBURY BUILDING
MINNEAPOLIS, MINNESOTA

This application has been examined.

References made of record:

Rix	287,965	Nov. 6, 1883	55-7
Elder	304,713	Sep. 9, 1884	97-200-x
Jones	431,981	July 8, 1890	97-200
Graham	2,493,811	Jan. 10, 1950	97-184
Petersen	57,391	Mar. 10, 1940	97-184

(Denmark) (2 pp. spec.—1 sht. drwgs.)

Claims 1 through 6 are rejected on Rix in view of either Elder or Jones. The expedient of providing a con-

vex surface to contact a washer and nut on a spring tension rod is shown to be old in the art by either Elder or Jones in the embodiment of lugs e' and 13 respectively. To provide a like surface on the nut engaging portion of the Rix shank holder is considered to be well within the expected skill of the art and devoid of invention.

Claim 7 is rejected on the same references relied upon and for the same reasons advanced in the rejection of claims 1 through 6 taken with Petersen. To provide a shoulder abutment on the holder of Rix would not constitute invention in view of the teachings of Petersen in the embodiment of shoulder abutment 17 on holder 2.

Upon allowance of any claim revision as to form may be required. Rule 105.

All the claims are rejected.

/s/ A. Joseph Greeley
Examiner

IN THE UNITED STATES PATENT OFFICE

(Mail Division, May 25, 1953, U.S. Patent Office)
(U.S. Patent Office, May 27, 1953, Division 1)

Re App	Elmer A. Rolf	Before the Primary Examiner Division 1
S. N.	283,174	
Filed	April 19, 1952	
For	SHANK HOLDER	

Hon. Commissioner of Patents
Washington 25, D. C.

Dear Sir:

Responsive to the official action of November 25, 1952 on the above entitled application, please make the following amendments to said application:

Without prejudice to the patentable subject matter contained therein, cancel Claims 3, 4, 5, 6 and 7.

Claim 2, line 1, substitute "mounting having in combination" for—holder comprising—; line 10, insert a comma at the end of the line; line 11, substitute "a vertically movable" for "for receiving therethrough an upright"; line 12,

insert "extending through said aperture and" after—rod —; line 17, substitute "mounting" for—holder—.

REMARKS

The action referred to above and the references cited therein have been carefully studied with respect to the instant application. Claims 3-7 have been cancelled for the sake of facilitating the prosecution of the application and since it is felt that if the two Claims contained in the application are allowed they will provide adequate protection for the patentee.

Claim 1 was rejected on Rix in view of either Elder or Jones, the Examiner indicating that Elder and Jones show it to be old in the art to provide a convex surface to contact a washer and nut on a spring tension rod. The attention of the Examiner is called to the fact, however, that the Rix device does not show a shank holder wherein any advantage would be obtained by so forming the lower surface of the elongated bar as specified in the Claims. Such a modification of the Rix device would merely provide a convex surface against which the spring would bear. There is no need for such a surface in the Rix device since the rod E is curved to provide for the arcuate movement of the apertured end of the shank holder. The adaptation therefore, would be a silly one since the Rix device functions in an entirely different manner. It seems clear, therefore, that there is no teaching in either Elder or Jones which would lead one to the structure defined in the Claims. The Rix device does not utilize the principle of a vertically movable rod which is resiliently urged upwardly to urge the shank downwardly into the ground. On the contrary, the Rix device uses a fixed rod with a spring mounted thereon and slidable therealong to provide the urging to the shank holder. It seems clear, therefore, that the structure claimed in Claim 1 would be arrived at by the Examiner or anyone skilled in the art only in the light of the applicant's disclosure and from a position of hindsight. Such modification and reconstruction in the light of the applicant's disclosure is clearly not permissible under well-established patent law. See *Topliff* v. *Topliff*, 145 US 156, and *Hobbs* v. *Beach*, 180 US 383.

The prior art may be utilized only for what the individual patents teach, not for what would result with modification or combinations of mechanisms from a number of patents which is taught only by the invention under consideration in the application.

The attention of the Examiner is also called to the fact that the structure shown in the Rix patent does not meet the structure defined in Claim 1. Claim 1 specifies that the transversely extending sleeve element is mounted upon the medial portion of the bar whereas in Mix the transversely extending sleeve element is mounted at the extereme end of the bar. This means that almost the entire strain of the upward urging on the shank is placed directly upon the pin end whereas in the applicant's device, more of the strain is borne by the resiliently urged tension rod 14.

Claim 2 has been amended to call for a shank mounting having in combination a rigid elongated bar with an upstanding sleeve element mounted upon the rearward end portion of the bar and a transversely extending sleeve element mounted upon the medial portion of the bar, and a vertically movable upwardly and resiliently urged tension rod extending through an aperture on the forward end of the bar. The Claim further specifies that the lower surface of the forward end portion of the bar is convexly shaped to facilitate the pivotal movement of the holder. Claim 2 was rejected on Rix in view of Elder or Jones but the Rix device fails to show the basic combination called for in the Claim. None of the references show the combination of a rigid bar having an upstanding sleeve element at one of its ends and a transversely extending sleeve at its medial portion and an aperture through its forward end portion through which a vertically movable tension rod extends which is constantly resiliently urged upwardly. The Rix device utilizes a fixed rod which cannot move upwardly. Furthermore, as pointed out above, the forward end of the bar slides along the rod instead of the rod moving with the bar as is the case in the applicant's device. It seems clear, therefore, that the basic combination has not been shown in Rix and therefore the Claim is clearly patentable, since it is fundamental and thoroughly established patent law that in order to properly reject a Claim by combining a number of patents, at

least one of those patents must show the basic combination called for in the Claim. Under well-established law, such as in the case of *Owens Co.* v. *Twin City Separator Co.*, 168 F 259, this means that at least one of the patents must disclose all of the salient elements or other mechanical equivalents doing substantially the same work by substantially the same means. It is respectfully submitted to be clear that Rix does not show all of the elements recited in Claim 2 and it does not show any element doing the work in the same manner.

In view of the above remarks, it is believed that the Examiner will agree that each of Claims 1 and 2 is properly patentable, and their early consideration and allowance is most respectfully requested.

Signed at Minneapolis, Minnesota, this 21st day of May, 1953.

ELMER A. ROLF
By his Attorneys
WILLIAMSON, WILLIAMSON, SCHROEDER & ADAMS
By E. J. Schroeder

EJS:mn

DEPARTMENT OF COMMERCE
United States Patent Office
Washington

Address Only
The Commissioner of Patents
Washington 25, D. C.

All communications respecting this application should give the serial number, date of filing, and name of the applicant.
Paper No. 5

Williamson, Williamson,
Schroeder and Adams
950 Pillsbury Building
Minneapolis, Minnesota

Applicant: Elmer A. Rolf
Ser. No. 283,174
Filed April 19, 1952
For SHANK HOLDER

(Mailed Mar. 4, 1954, Pat. Div. 1)

Please find below a communication from the EXAMINER in charge of this application.

/s/ Robert C. Watson

Commissioner of Patents.

Responsive to amendment filed May 25, 1953.

Additional reference made of record:

Graham	2,627,798	Feb. 10, 1953	97-47.83

(Filed Aug. 27, 1951)

The above cited patent has become available as a reference since the first Office action.

Claims 1 and 2 are rejected as not patentable over the above cited patent to Graham, 2,627,798, in view of the patent of record to Graham, 2,493,811, and either of the patents of record to Jones or Elder. It would not require invention to reverse the position of member 12 of Graham, 2,627,798, so as to place it on the lower side of the tool shank 2 as is the member 63 of Graham, 2,493,811, and to substitute the nut and washer and convex surface of Jones at 13 or Elder at E' for the member 64 of Graham, 2,627,798. Such a substitution of equivalents would be no more than an obvious substitution of well known equivalents, not amounting to invention.

Claim 2 is further rejected as vague and indefinite in the last four lines in that "the pivotal movement of the mounting relative to the mounting" is not clear.

Claims 1 and 2 are rejected.

Claims 3 through 7 have been canceled.

/s/ A. Blum

Actg. Examiner

FBS

F. B. Sherry/wm

IN THE UNITED STATES PATENT OFFICE

(Mail Division, Sept. 3, 1954, U.S. Patent Office)
(U.S. Patent Office, Sept. 9, 1954, Division 1)

Re App	Elmer A. Rolf	Before the Primary Examiner Division 1
S. N.	283,174	
Filed	April 19, 1952	
For	SHANK HOLDER	

Hon. Commissioner of Patents
Washington 25, D. C.

Dear Sir:

AFFIDAVIT under Rule 131

STATE OF MINNESOTA)
) SS
COUNTY OF HENNEPIN)

I, Elmer A. Rolf, Glencoe, Minnesota, being first duly sworn depose and say as follows:

I am the inventor of the Shank Holder disclosed and claimed in application for United States Letters Patent, Serial Number 283,174 filed by me in the United States Patent Office on April 19, 1952, and entitled "SHANK HOLDER". I conceived and reduced to practice this invention within this country by producing a pattern of the Shank Holder shown and claimed in the above entitled application for patent and submitted the same to Prospect Foundry Company, 1225 Winter Street, Minneapolis, Minnesota, for commercial manufacture thereof as early as May, 1951. The original pattern equipment is still in existence at the Prospect Foundry Company and the partners of the company can produce the same upon demand.

/s/ Elmer A. Rolf

Subscribed and sworn to before me, a Notary Public, this 2nd day of September, 1954.
(Seal)

L. M. Overby
Notary Public, Hennepin County, Minnesota.

My Commission expires Feb. 25, 1955.

IN THE UNITED STATES PATENT OFFICE
(Mail Division, Sept. 3, 1954, U.S. Patent Office)
(U.S. Patent Office, Sept. 9, 1954, Division 1)

Re App Elmer A. Rolf
S. N. 283,174
Filed April 19, 1952
For SHANK HOLDER

Before the Primary Examiner
Division 1

Hon. Commissioner of Patents
Washington 25, D. C.

Dear Sir:

AFFIDAVIT under Rule 131

State of Minnesota)
) SS
County of Hennepin)

I, Stanley J. Sitarz, 1951 Stinson Boulevard, Minneapolis, Minnesota, being first duly sworn, depose and say as follows:

I am one of the partners of Prospect Foundry Company, 1225 Winter Street, Minneapolis, Minnesota. I hereby certify that our company manufactured and shipped Shank Holders manufactured in strict accordance with the copy of the drawings for application for United States patent, Serial Number 283,174 which is attached hereto and designated as Exhibit A. This Shank Holder was given part No. HDC 2497 and we have manufactured and shipped a number of the same as early as May, 1951, as is evidenced by the invoice attached hereto and designated as Exhibit B. Mr. Elmer A. Rolf of Glencoe, Minnesota submitted a pattern of this Shank Holder to us as early as May, 1951, and these Shank Holders, part No. HDC 2497, were manufactured and shipped for Glencoe Manufacturing Company in strict accordance with that pattern.

/s/ Stanley J. Sitarz

Subscribed and sworn to before me, a Notary Public, this 1st day of September, 1954.

Walter F. Sexton
Notary Public

Commission expires 7-18-55

615

PROSPECT FOUNDRY CO.

#6

ORIGINAL

MAIL DIVISION SEP 1951 PATENT OFFICE

GRAY IRON LOW CARBON ALLOY CASTINGS
1225 WINTER ST. N. E. GLADSTONE 2461

MINNEAPOLIS 14, MINN. U.S. PATENT OFFICE 194 51

SOLD TO Glascock Bell Co.

ADDRESS

SEP 5

ORDER NO.	QUANTITY	PATTERN NO.	WEIGHT	PRICE	AMOUNT
853	64	HDC 7497	256 lb		
		Ductile Cannabal			
		.78 ea			49.92

RECEIVED THE ABOVE IN GOOD ORDER

REC'D BY Harold Peterson Jr NO. 16337

BOOST BUSINESS FORMS, INC., MINNEAPOLIS, MINN.

23

617

All. 6927

PROSPECT FOUNDRY

#6

1225 WINTER ST. N. E. -:- MINNEAPOLIS 14, MINN.

GRAY IRON - DUCTILE IRON
LOW CARBON ALLOY CASTINGS

U.S. PATENT OFFICE

SOLD TO May 29, 1951

Glencoe Mfg.Co.

DATE SEP 9 1 ..

SHIPPED TO DIVISION 2

Terms: Net 10th of month F. O. B.

INVOICE NO. 16337

ORDER NO.	QUANTITY	PATTERN NO.	WEIGHT	PRICE	AMOUNT
853	64	HDC 2497 Ductile Annealed	256#	.78 ea.	$ 49.92

24

#6

619

FIG. 2

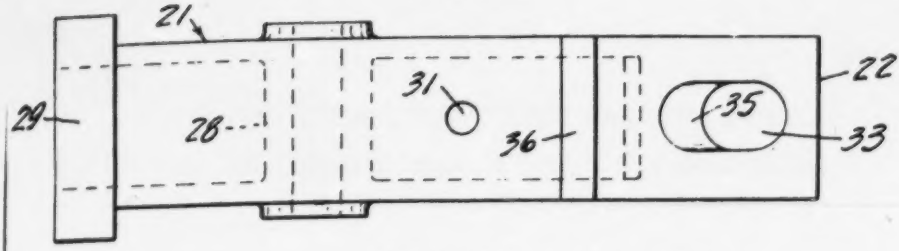


FIG. 3

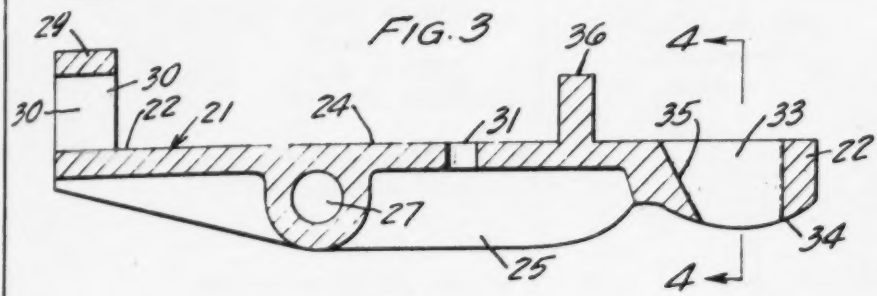


FIG. 1

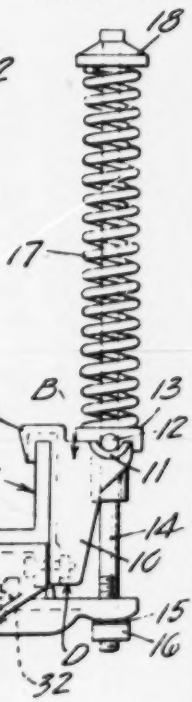
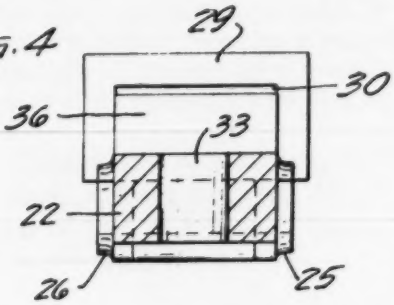


FIG. 4



INVENTOR
ELMER A. ROLF
BY
Williamson, Williamson, Schroeder & Adams
ATTORNEYS

IN THE UNITED STATES PATENT OFFICE

(Mail Division, Sept. 3, 1954, U.S. Patent Office)
(U.S. Patent Office, Sept. 9, 1954, Division 1)

Re App	Elmer A. Rolf	Before the Primary Examiner Division 1
S. N.	283,174	
Filed	April 19, 1952	
For	SHANK HOLDER	

Hon. Commissioner of Patents
Washington 25, D. C.

Dear Sir:

Responsive to the official action of March 4, 1954 on the above entitled application, it is respectfully requested that reconsideration be given the instant application in the light of the remarks made hereinbelow. It is also respectfully requested that the application be amended as follows:

Claim 2, line 8, substitute "bar" for—holder—. Line 16, substitute "said bar" for—the—second occurrence. Make line 17 read as follows: "relative to the mounting while the forward portion".

REMARKS

The action referred to above has been carefully studied with respect to the instant application. Claim 2 has been carefully amended to overcome the objection as to vagueness and indefiniteness in the last four lines of that claim.

It is respectfully requested that the Graham patent No. 2,627,798 be withdrawn as a reference from the instant application under Rule 131 entitled "Affidavit of Prior Invention to Overcome Cited Patent or Publication". Submitted herewith is an affidavit from the inventor stating that he reduced the instant invention to practice well in advance of the filing date of said Graham patent which was August 27, 1951. The applicant's affidavit states that he had reduced his invention to practice as early as May, 1951.

Also submitted herewith is an affidavit from Mr. Stanley J. Sitarz, a partner of the Prospect Foundry Company, Minneapolis, Minnesota. In this affidavit, Mr. Sitarz states that his company manufactured and shipped shank holders embodying the invention of the instant application as early as May, 1951 in behalf of Elmer A. Rolf, the applicant, who is one of the partners of Glencoe Manufacturing Company, Glencoe, Minnesota. Attached to the affidavit of Mr. Sitarz is a copy of the drawings of the instant application from which he identified the structure manufactured by him for Mr. Rolf as part No. HDC 2497. This number is casted on the casting. Also attached to the affidavit is a copy of an invoice of the Prospect Foundry Company of which Mr. Sitarz is a partner, clearly establishing shipment of such parts as early as May, 1951.

In view of the above it is believed that the applicant has clearly set forth ample proof of having reduced his invention to practice well in advance of the filing date of the Graham patent No. 2,627,798 and therefore that patent is not a proper reference against the allowance of the instant application.

In view of the fact that the rejection relies upon this Graham patent No. 2,627,798 as the primary reference it is believed to be clear that the allowance of Claims 1 and 2 is now proper, and their early consideration and allowance is most respectfully requested.

ELMER A. ROLF
By his Attorneys
WILLIAMSON, WILLIAMSON, SCHROEDER & ADAMS
By E. J. Schroeder

Minneapolis, Minn., September 2, 1954
EJS/ds
Attach.

Paper No. 7
Serial No. 283,174

REFERENCES CITED

The following references are of record in the patented file of this patent:

UNITED STATES PATENTS

Name	Number	Date
Rix	287,965	Nov. 6, 1883
Elder	304,713	Sept. 9, 1884
Jones	431,981	July 8, 1890
Graham	2,493,811	Jan. 10, 1950
Graham	2,627,798	Feb. 10, 1953

FOREIGN PATENTS

Country	Number	Date
Denmark	57,391	Mar. 10, 1940

OTHER REFERENCES

dm—Class. Div. IV

DEPARTMENT OF COMMERCE

United States Patent Office
Washington

Address Only
The Commissioner of Patents
Washington 25, D. C.

All communications respecting this application should give the serial number, date of filing, and name of the applicant.

NOTICE OF ALLOWANCE

(Mailed August 24, 1955. Class Div. IV)

The application for patent identified below has been examined and found allowable for issuance of Letters Patent.

Applicant (Assor.) Elmer A. Rolf
Title of Invention or Improvement Shank Holder
Serial No. 283,174

Filing Date April 19, 1952

No. Claims Allowed 2

Examiner Mrs. M. P. Smith

With the allowance of the application the final fee becomes due. This fee is thirty dollars ($30) plus one dollar ($1) for each claim allowed in excess of twenty (20) and must be paid within 6 months from the date of this notice. Failure to remit the final fee will result in the patent being withheld from issue.

As a convenience in remitting this fee, use of the enclosed Form POL-85a is suggested. The final fee will not be received from anyone other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office.

If it is desired to have the patent issued to an assignee or assignees, an assignment, together with the fee for recording the same, must be filed in this Office on or before the date of payment of the final fee.

The patent will be issued and forwarded within approximately two months after receipt of the final fee.

By direction of the Commissioner.

Williamson, Williamson, Schroder
and Adams
950 Pillsbury Building
Minneapolis, Minnesota

625-

Cl. - Class. Div. IV

345954

PSL-258A
1-1-53

FINAL FEE TRANSMITTAL

This form is provided for convenience in transmitting final fees to the Patent Office. When properly completed it may be used in lieu of a formal transmittal letter. Respondents will note and fill in items numbered 1 thru 6 below. The Final Fee Receipt, in all cases, will be mailed to the address appearing in box at lower left of this form. If desired, use the reverse side of your Notice of Allowance for carbon copy when completing this form.

1. The COMMISSIONER OF PATENTS is requested to apply the accompanying fee to the case identified below, and deliver the patent as indicated.

FEB 21 1956

February 20, 1956 — Williamson, Schroeder, Adams & Meyers

Date — Attorney, Agent or Applicant

NOTE—Final fees will not be received from other than the applicant, his assignee, or attorney, or a party in interest as shown by the records of the Patent Office. Final fees will not be applied to pending applications.

Notice of Allowance Date

MAILED

AUG 24 1955

CLASS D.J. IV

APPLICANT (Assgr.)

Elmer A. Ralf

TITLE OF INVENTION OR IMPROVEMENT

SHARK HOLDER

SERIAL NO.	FILING DATE	NO. OF CLAIMS ALLOWED	EXAMINER
288,176	April 19, 1952	2	(Mrs.) M. P. Smith

2. DEFERMENT: (Indicate below if desired)

3. FEE ENCLOSED

$ 30.00

4. Assignee:

MAILING INSTRUCTIONS

Note—The office will send the patent to the address entered in stub at left below unless you direct otherwise. Use the spaces provided to indicate any changes which affect the delivery of the patent.

5. Do not send the patent to the addressee listed below. Send patent to (check one)

☐ Patentee

☐ Assignee

☐ Associate Attorney (See specific authorization in file)

☐ Change of address—Attorney

The address of the person checked above is typed in Item 6 below.

6.

30

283174

4/19/52

627

CONTENTS

1.	Application papers.	26.	
2.	Bryant April 25, 1952	27.	
3.	Rejection. NOV 25 1952	28.	
4.	Amdt A May 25, 1953	29.	
5.	Rejection MAR 4 1954	30.	
6.	Amdt B. Abbott & Eph. Sept. 3/54	31.	
7.		32.	
8.		33.	
9.		34.	
10.		35.	
11.		36.	
12.		37.	
13.		38.	
14.		39.	
15.		40.	
16.		41.	
17.		42.	
18.		43.	
19.		44.	
20.		45.	
21.		46.	
22.		47.	
23.		48.	
24.		49.	
25.		50.	

16—11278-7 U. S. GOVERNMENT PRINTING OFFICE

U. S. PATENT OFFICE

APR 30 1952

DIVISION 1

PAPERS AS FILED MICROFILMED

PLAINTIFFS' EXHIBIT P

Plt. Ex. 629

PLF. EX. P

D.C.F.

March 27, 1956 E. A. ROLF 2,739,518

SHANK HOLDER

Filed April 19, 1952

FIG. 2

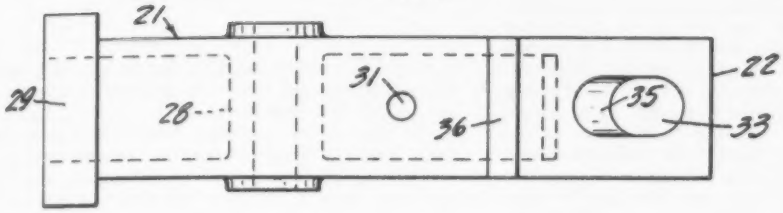


FIG. 3

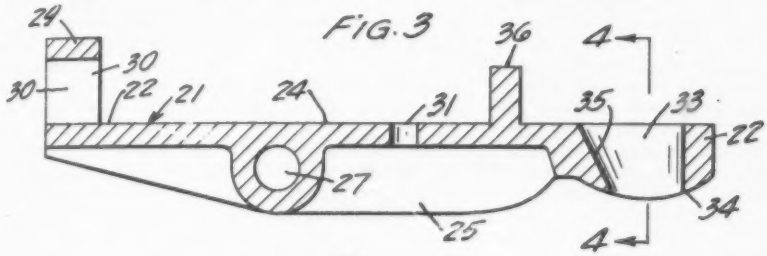
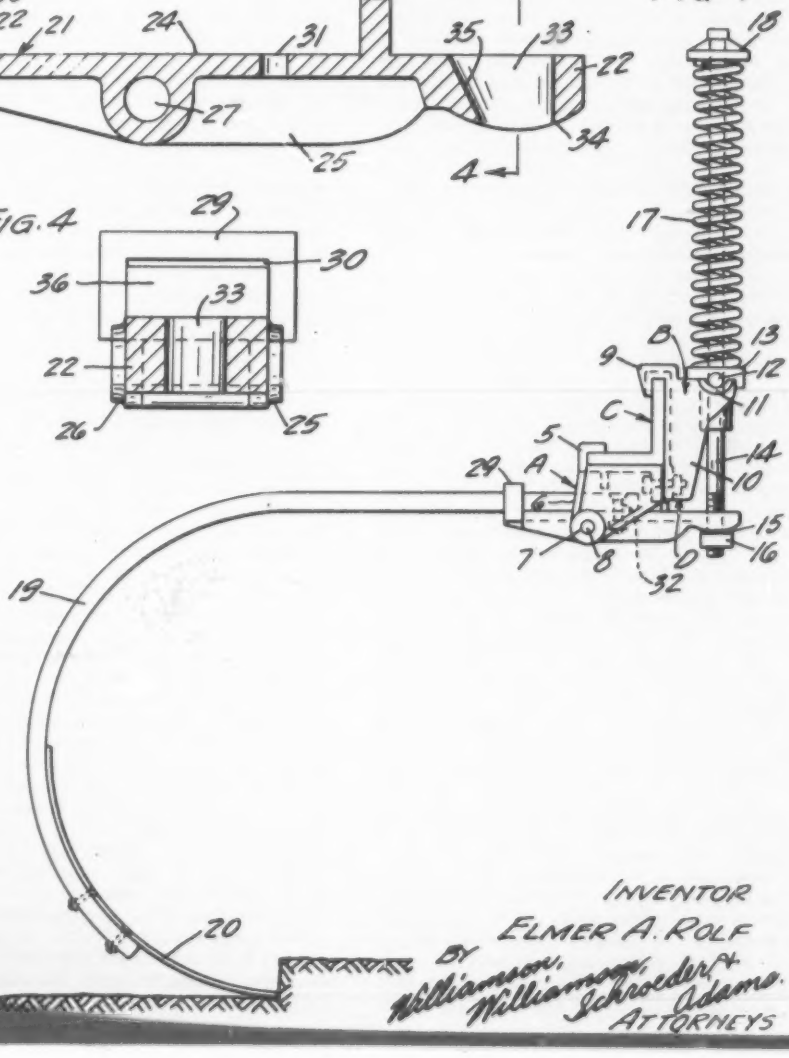


FIG. 4

FIG. 1



INVENTOR
ELMER A. ROLF
BY
Williamson, Williamson, Schroeder & Adams.
ATTORNEYS

631

United States Patent Office

2,739,518

Patented Mar. 27, 1956

2,739,518

SHANK HOLDER

Elmer A. Rolf, Glencoe, Minn., assignor to Glencoe Manufacturing Company, Glencoe, Minn., a corporation of Minnesota

Application April 19, 1952, Serial No. 283,174

2 Claims. (Cl. 97—47.84)

This invention relates to shank holders for holding the shanks of agricultural implements and the like. More particularly, it relates to shank holders for holding the shank of an agricultural implement or the like which is constantly urged into ground-engaging relation and which must necessarily be able to rock or pivot at its forward end to permit the implement to yield when exceptionally heavy obstructions are met.

It is a general object of my invention to provide a novel and improved shank holder of cheap and simple construction.

Another object is to provide a novel and improved shank holder upon which the shank may be quickly and simply mounted.

Another object is to provide a shank holder adapted to be pivotally mounted for use in conjunction with an upright upwardly urged tension rod at its forward end and having its forward end portions so constructed as to facilitate such pivotal movement.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

Fig. 1 is a side elevational view of one embodiment of my invention used in conjunction with a pair of mounting members which secure the ground implement to a cross member of an agricultural machine;

Fig. 2 is a top plan view of my shank holder;

Fig. 3 is a longitudinal sectional view of the same; and

Fig. 4 is a transverse vertical sectional view taken approximately along line 4—4 of Fig. 3.

One embodiment of my invention is shown in Fig. 1 pivotally mounted upon a pair of mounting members indicated generally as A and B. These mounting members positively engage the cross member C of the agricultural machine. As shown, the mounting member A has a channel element 5 and a pair of depending webs 6 which extend downwardly from its opposite sides and each of which has a transversely extending aperture 7 formed therethrough. These apertures carry pivot pin 8 which extends thereacross and therethrough to provide a pivotal axis for the shank holder which embodies my invention. The other mounting member B has a channel member 9 which engages the cross member C and a pair of spaced generally triangularly shaped side portions 10 which extend vertically and forwardly with respect to the cross member C. Each of the side portions 10 has a groove or recess 11 adapted to receive therein the ears 12 of a collar 13 which is slidably mounted upon an upright tension rod 14. The tension rod 14 is threaded at its lower end and carries a washer 15 and a nut 16 thereupon. Mounted on the upper end portion of the tension rod 14 is a compression spring 17 the lower end of which abuts against the collar 13 and the upper end of which abuts against the broad end portion 18 of the tension rod. The compression spring 17 continuously urges the collar 13 downwardly and resists any attempt to draw

the tension rod 14 further downwardly. The two mounting members A and B are held together by bolts D so that the channel members 5 and 9 will positively engage the cross member C and provide a rigid mounting for the shank holder shown.

The structure recited above is utilized in conjunction with my shank holder to mount a shank 19 and an agricultural implement 20, which it carries, upon the cross member C.

Figs. 2, 3 and 4 show in greater detail the shank holder which embodies my invention. As shown, it includes a rigid elongated bar 21 which has a forward end portion 22, a rearward end portion 23, and a medial portion 24. Along its side edges is a pair of spaced and oppositely depending webs 25 and 26 which extend longitudinally of the bar 21 and have oppositely disposed apertures 27 formed therethrough, these apertures extending transversely of the bar 21 and being adapted to receive the pivot pin 8 which extends through the lower end portion of the mounting member A. A sleeve element 28 having the same internal bore as the apertures 27 connects the two side webs 25 and 26 to provide a pivotal bearing for the bar 21.

Mounted upon the upper surface of the bar 21 and extending upwardly therefrom is a longitudinally extending sleeve element 29, the bore 30 of which is of such size as to readily receive the shank 19 therethrough so that the shank will extend longitudinally of the bar 21. Formed through the bar 21 on the opposite side of the sleeve 28 with respect to the sleeve 29 is a vertically extending aperture 31 adapted to receive a bolt 32 which rigidly affixes the forward end of the shank 19 to the bar 21 at that point.

The forward end portion 22 of the bar 21 is vertically apertured as at 33 and has a lower surface 34 which is shaped convexly and which functions as an abutment surface for the washer 15 and is urged upwardly by the spring 17 and the nut 16. The bore of the aperture 33 is such that the portion of the bar 21 which forms the rear wall 35 of the aperture slopes upwardly and rearwardly as best shown in Fig. 3. The aperture 33 itself is of greater dimensions longitudinally of the bar than transversely as is best shown in Fig. 2.

Mounted on the upper surface of the bar 21 and extending upwardly therefrom is an abutment shoulder 36 which is positioned between the aperture 31 and the aperture 33. This abutment shoulder 36 when the entire unit is assembled abuts against the lower end portion of the mounting member B to prevent the upper surface of the forward end portion of the plate 21 from pivoting to a position above horizontal.

In operation, the shank holder is mounted upon the mounting members A and B in the manner shown in Fig. 1 with the shank slid from the rear through the sleeve 29 and affixed by the bolt 32 to the portion of the bar forward of the transverse sleeve 28. The shank holder is pivotally mounted between the depending webs 29 of the mounting member A by slipping the pivot pin 8 through the aperture 7 of the web and through the sleeve 28. The tension rod 14 is then inserted through the aperture 33 and the washer 15 and the nut 16 threaded onto the lower end portion of the tension rod 14 so that the washer 15 will abut against the abutment surface 34 of the forward end portion of the shank holder.

As the agricultural machine (not shown) is drawn forwardly the implement 20 is maintained in ground-engaging position by the upward urging upon the forward end portion of the shank holder which is exerted by the tension rod 14 and the spring 17. Whenever an obstacle is encountered or a particularly hard area of ground is engaged the implement tends to raise upwardly and the shank and the shank holder pivot about the pivot pin 8

with the forward end portion 22 of the shank holder moving downwardly in the direction shown by the arrow in Fig. 1. As this takes place the angle between the top surface of the bar 21 and the tension rod 14 changes and the tension rod 14 moves over toward the rearwardly sloping rear wall portions 35 of the aperture 33. At the same time the washer 15 slides easily forwardly around the convexly shaped abutment surface 34. By so constructing my shank holder the pivotal movement of the same is unobstructed and unhindered except for the upward urging of the spring 17. Thus my shank holder makes its possible to provide a truly pivotal mounting for the forward end of the shank 19 and places a much lesser strain upon the implement 20 itself which in the past has frequently resulted in undue and unnecessary breakage of the implement.

Thus it can be seen that I have provided a novel and improved shank holder of extremely simple and cheap construction. It can be readily seen that my shank holder is constructed so as to provide the maximum in freedom of pivotal movement of the same so that no undue strain is placed upon any part of the mounting or holder for the shank. The freedom of movement provided by the rearwardly extending walls 35 of the aperture 33 and the pivotal mounting of the tension rod 14 provided by the ears 12 of the collar 13 and the grooves 11 makes it possible for the read end portion of the shank 19 to raise to any level which may ordinarily be required in ground-working operations.

It will of course be understood that various changes may be made in the form, details, arrangement, and proportions of the various parts without departing from the scope of my invention.

What is claimed is:

1. A shank holder comprising a rigid elongated bar, means for rigidly connecting the shank to the rearward end portion of said bar to extend longitudinally thereof, a transversely extending sleeve element mounted upon the medial portion of said bar and adapted to pivotally connect the holder to an implement mounting for pivotal movement relative thereto, said bar having an aperture formed at its forward end portion for receiving therethrough an upright upwardly and resiliently urged tension rod having a washer and nut at its lower end for abutment against the lower surface of said forward end portion, the lower surface of the forward end portion of said bar surrounding said aperture being convexly shaped to facilitate the pivotal movement of the holder relative to the mounting while the forward portion thereof is urged upwardly by the washer and nut on the tension rod.

2. A shank mounting having in combination a rigid elongated bar, an upstanding sleeve element mounted upon the rearward end portion of said bar with the opening of said sleeve element extending longitudinally of said bar to accommodate a shank therewithin and to facilitate the connection of the shank to said bar, and a transversely extending sleeve element mounted upon the medial portion of said bar and adapted to pivotally connect the bar to an implement mounting for pivotal movement relative thereto, said bar having an aperture formed in its forward end portion, a vertically movable upwardly and resiliently urged tension rod extending through said aperture and having a washer and nut at its lower end for abutment against the lower surface of said forward end portion, the lower surface of the forward end portion of said bar surrounding said aperture being convexly shaped to facilitate the pivotal movement of said bar relative to the mounting while the forward portion thereof is urged upwardly by the washer and nut on the tension rod.

References Cited in the file of this patent

UNITED STATES PATENTS

287,965	Rix	Nov. 6, 1883
304,713	Elder	Sept. 9, 1884
431,981	Jones	July 8, 1890
2,493,811	Graham	Jan. 10, 1950
2,627,798	Graham	Feb. 10, 1953

FOREIGN PATENTS

57,391	Denmark	Mar. 10, 1940

PLAINTIFF'S EXHIBIT Q.

OPINION LETTER OF JUDGE JOS. B. DOOLEY.

Filed March 14, 1957.

United States District Court For The Northern District of Texas

Joseph B. Dooley
U. S. District Judge

Amarillo, Texas
March 14, 1957

Underwood, Wilson, Sutton, Heare & Boyce
Amarillo, Texas

Gibson, Ochsner, Harlan, Kinney & Morris
Amarillo, Texas

Re: Wm. T. Graham, et al., v. Cockshutt Farm Equipment, Inc., No. 1953-Civil, Amarillo Division.

Gentlemen:

In the above cause I hold that both claims of the plaintiff's patent 798 are valid, but that same being simply an improvement patent in a somewhat crowded art, its limited equivalency range does not embrace the accused Cockshutt clamp, and there is no infringement of either claim in the patent.

I think the recent patent case styled Cameron Iron Works, Inc. v. Robert O. Stekoll, d/b/a Speed-O-Valve Co., decided February 27, 1957, by the Court of Appeals for the Fifth Circuit, will be of interest to counsel.

Counsel, respectively, may present suggestions of more detailed findings and conclusions, and in this instance might collaborate in drawing a proper decree for presentation to the Court promptly.

The metallic exhibits in this case are in the Court reporter's office, but now counsel should arrange to remove and store same elsewhere promptly, and I will thank you

to do that this week, as all of the Court personnel will be in Wichita Falls next week.

Sincerely yours,

(S.) JOS. B. DOOLEY,
United States District Judge.

CC: Fishburn, Mullendore & Gold,
Kansas City, Mo.

ORDER FOR FILING COURT'S LETTER OF MARCH 14, 1957, AS PART OF THE RECORD.

Filed: September 3, 1957.

(Title Omitted.)

At the request of counsel for all parties, it is ordered that the Court's letter dated March 14, 1957, addressed to respective counsel, announcing the Court's decision in this cause be filed by the Clerk and included as a part of the record in this cause.

Dated September 3rd, 1957.

JOS. B. DOOLEY,
United States District Judge.

Approved:

CLAYTON HEARE,
Of Counsel for Plaintiffs.

S. TOM MORRIS,
Of Counsel for Defendant.

FINDINGS OF FACT AND CONCLUSIONS OF LAW.

Filed July 12, 1957.

(Title Omitted.)

The Court hereby makes and files in the above cause Findings of Fact and Conclusions of Law, as follows:

Findings of Fact.

1.

The Plaintiff, William T. Graham, resides at Amarillo and is a citizen of Texas. The Plaintiff, Graham-Hoeme Plow Co., Inc., is a domestic corporation domiciled at Amarillo, Texas. The Defendant, Cockshutt Farm Equipment, Inc., is a corporation organized under the laws of the State of Delaware with a principal place of business at Bellevue, Ohio, and having a regular and established place of business at Amarillo, Texas.

2.

The Court has jurisdiction of the parties and the subject matter of this suit.

3.

On January 10, 1950, Letters Patent No. 2,493,811 was issued to William T. Graham on an application filed February 26, 1947, for an invention relating to a subject designated "Vibrating Plow and Mounting Therefor". Said Graham is the owner thereof and Graham-Hoeme Plow Co., Inc. is a licensee under said Letters Patent.

4.

The Court finds that Graham Patent No. 2,493,811 is valid and Defendant admits infringement thereof by the sale of a device as exemplified in Plaintiffs' Exhibit No. 3. Plaintiffs have admitted that Defendant's clamp, exemplified by Plaintiffs' Exhibit No. 4, does not infringe said patent. Plaintiffs have waived any claim that Defendant was wilful or deliberate in said infringement and any claim for increased damages or attorney's fees therefor under above patent.

5.

On February 10, 1953, Letters Patent No. 2,627,798, was issued to William T. Graham on an application filed August 27, 1951, for an invention relating to a subject desig-

nated "Clamp For Vibrating Shank Plows". Said Graham is the owner thereof and Graham-Hoeme Plow Co., Inc., is a licensee under said Letters Patent.

6.

Patent No. 2,627,798 relates to what is commonly called a "spring clamp" and as disclosed in the patent, may be said to generally comprise a body portion attached to the lower flange of the H-beam and having a part pivoted or rocking on the body portion, the movable part being the fulcrum plate. The forward end of the shank is connected to the fulcrum plate at the forward end of said plate at a substantial distance from the pivoted point of the movable part of the clamp. A coil spring is arranged at the forward end of the fixed part and through a nut, washer and spring rod, acts on the shank and fulcrum plate to resiliently urge the forward end of the shank and fulcrum plate upwardly toward the fixed part of the clamp so that when forces are exerted backwardly and upwardly on the ground working tool, the forward end of the shank will move downwardly against the tension of the spring and rock or pivot with the movable part of the fulcrum plate. The shank is supported relative to the movable member by a stirrup which is adjacent to the pivot of the movable part. The stirrup supports the shank, but does so in a manner that permits movement of the shank thereby retaining the flexibility of the structure and reducing shock and eliminating some of the wear.

7.

Graham conceived the idea for the clamp of Patent No. 2,627,798 about March 1950, at which time his first drawing, Plaintiffs' Exhibit No. 12, was made at his direction by an employee, Proctor. Nothing further was done toward development of the idea until May 1951, at which time the second and third drawings, Plaintiffs' Exhibits Nos. 13 and 14, were made at his direction by the same employee. Only one aluminum model of the clamp, Defendant's Exhibit No. 38, has ever been made by the Plaintiffs and none of the clamps has ever been manufactured,

sold, used or tested by Plaintiffs. Graham did not use reasonable diligence in reducing the conception to practice until approximately the time that he filed his patent application on August 27, 1951. The date of invention to which he is entitled is August, 1951.

8.

The Glencoe clamp was first made and tested as early as August 1949, at which time it was exhibited to the public and photographed. Commercial manufacture thereof was commenced as early as December 1949, and it was offered for sale and actual orders were taken as early as March 14, 1950. It was advertised for sale in a printed publication in the United States in April 1950. Actual sale and delivery was made as early as May 22, 1950, and numerous other sales were made thereafter and prior to August 27, 1951.

9.

All of the prior patents relied upon herein by Defendant, except Rix No. 287,965 and Roberts No. 1,809,599, and all of the prior use devices relied upon by Defendant, except the Glencoe device, have heretofore been before this Court in previous Graham v. Jeoffroy litigation.

10.

The prior art as a whole, in one form or another, contains all of the mechanical elements of the Graham 798 structure, and in a broad sense all of the elements are found in one single reference, the Glencoe clamp, however, the particular arrangement of the elements, disclosed by 798, is not present in any single reference, or as a whole.

11.

No new, but a better, functional result is obtained by the 798 structure, and the main improvement is due to the particular arrangement of the shank in relation to the hinge and spring member, which reflects in outward flexing of the shank at the forward portion thereof alongside

the plate portion of the hinge member, and does lessen wear and tear to some parts of the clamp.

12.

The Glencoe structure uses a rotating pivot which prevents rubbing contact of the shank with the fixed member of the clamp and means for attaching the shank to the hinge member, or fulcrum member, which permits flexibility of the shank equal in magnitude to that which would be expected in the 798 patent structure, however, the flexing of the shank is different in direction and location than that which occurs in the last named structure.

13.

The Graham 798 is an improvement patent in a somewhat crowded art, but is sufficiently different in detailed construction and operation to involve invention.

14.

Plaintiffs have admitted that Defendant's clamp of the type identified as Plaintiffs' Exhibit No. 3 does not infringe said Patent 798. Moreover, neither claim of the patent can be literally read upon Defendant's clamp of the type identified as Plaintiffs' Exhibit No. 4. Defendant's spring clamp, as exemplified by said Exhibit, has a plate between the shank and fixed member of the clamp, but the plate does not have a shank embracing portion thereon, the plate rocks against a portion of the fixed member instead of being pivoted on a pivot pin, and the forward ends of the plate and shank are not held together by a bolt and nut, and in these, as well as other respects, differs sufficiently from the limited equivalency range of the said Patent 798 so as to avoid infringement of the claims in said patent.

Conclusions of Law.

1.

The Defendant's admissions that one type of its clamp infringes Patent 2,493,811 entitles the Plaintiffs to a per-

manent injunction against the Defendant in respect to Claims 1, 2, 4, 5, 6, 7 and 8 of said patent, and an accounting for compensatory damages, as well as any further recovery authorized by law and awarded in the discretion of the Court.

2.

Patent No. 2,627,798 is valid, but not infringed in either claim by the Defendant's clamp, exemplified in Plaintiffs' Exhibit No. 4, and the complaint as to said patent should be dismissed.

Dated this the 12 day of July, 1957.

JOS. B. DOOLEY,
United States District Judge

JUDGMENT.

Filed July 12, 1957.

In the United States District Court for the Northern District of Texas, Amarillo Division.

William T. Graham and Graham-Hoeme Plow Co., Inc., Plaintiffs,

v. No. 1953—Civil.

Cockshutt Farm Equipment, Inc., a corporation, Defendant.

This cause having been tried upon proceedings in open Court without jury, and the Court having heard and considered the evidence, the briefs, and argument of counsel, and having made Findings of Fact and Conclusions of Law, and the Court being fully advised in the premises, it is

Ordered, Adjudged and Decreed, as follows:
As To Patent No. 2,493,811.

I.

Patent No. 2,493,811 is valid and by admission Defendant, Cockshutt Farm Equipment, Inc., has infringed Patent

No. 2,493,811 by sale of clamps of the type identified as Plaintiffs' Exhibit No. 3.

II.

By admission Defendant's clamps of the type identified as Plaintiffs' Exhibit No. 4 do not infringe Patent No. 2,493,811.

III.

Defendant, Cockshutt Farm Equipment, Inc., its officers confederates, associates, servants, attorneys, agents, clerks, and workmen and every person acting for and on behalf of said defendant are hereby perpetually enjoined and restrained from directly or indirectly making or causing to be made, selling or causing to be sold, using or causing to be used clamps of the type identified as Plaintiffs' Exhibit No. 3, or any other device embodying the invention defined by the Graham Patent No. 2,493,811.

IV.

The Plaintiffs, William T. Graham and Graham-Hoeme Plow Co., Inc., shall recover from the defendant, Cockshutt Farm Equipment, Inc., compensatory damages and the said Defendant, its officers, agents, clerks and employees shall submit to such oral examination as may be directed and shall preserve and produce as ordered all of said Defendant's books, vouchers, accounts and other documents relating in any wise to said infringement.

V.

The Court retains and reserves jurisdiction for the purpose of ascertaining and fixing the amount of compensatory damages and for the purpose of fixing and taxing the costs and the amount thereof to be paid by the respective parties.

As To Patent No. 2,627,798.

VI.

Patent No. 2,627,798 is valid; Plaintiff, William T. Graham is the owner thereof and Plaintiff, Graham-Hoeme Plow Co., Inc., is a licensee thereunder.

VII.

The Defendant, Cockshutt Farm Equipment, Inc., has not infringed patent No. 2,627,798 or either of the claims thereof.

VIII.

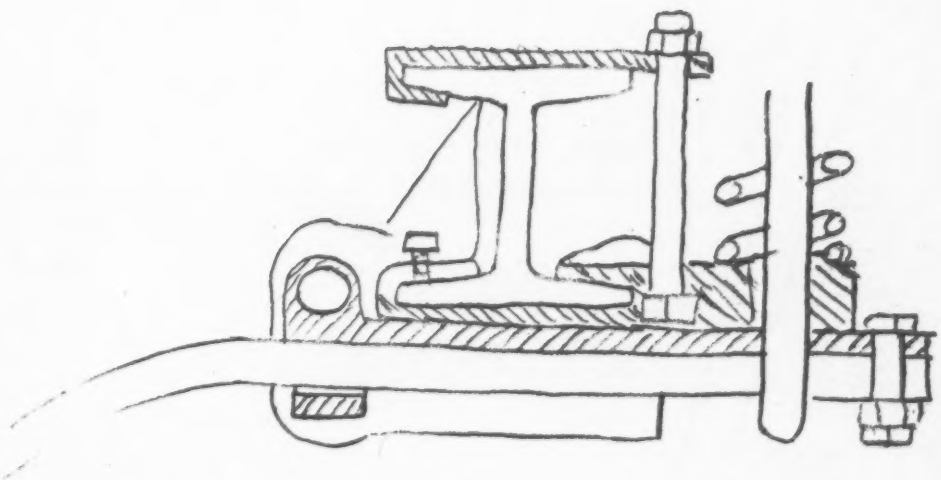
The complaint is dismissed as to patent No. 2,627,798, and all costs of suit as to said patent are charged against Plaintiff.

Signed this 12th day of July, 1957.

JOS. B. DOOLEY,
United States District Judge.

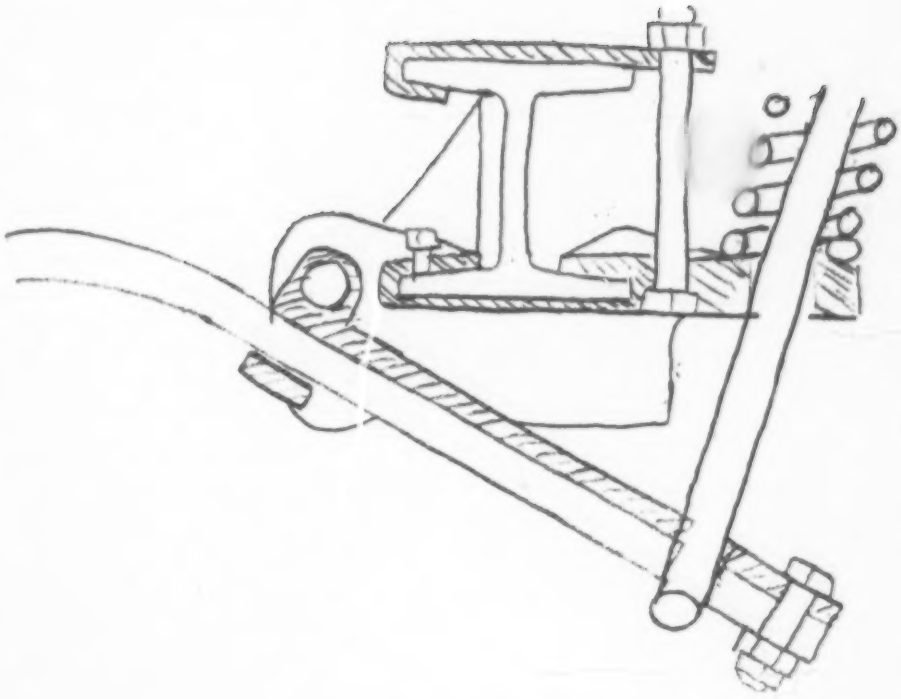
PLAINTIFFS' EXHIBIT R

643



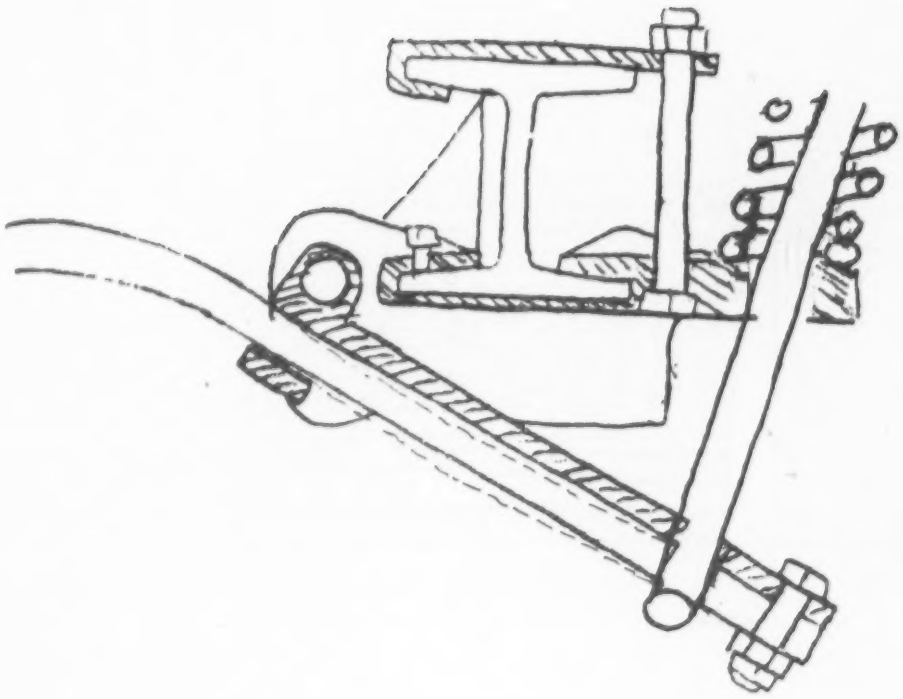
PLAINTIFFS' EXHIBIT S

645



PLAINTIFFS' EXHIBIT T

647



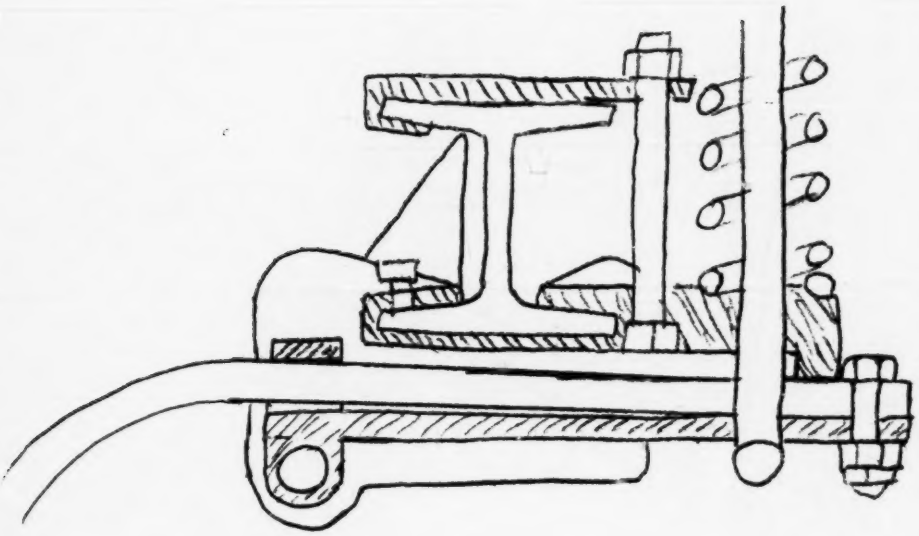
BEST COPY AVAILABLE

PUBLISHER'S NOTICE

Material on the following frames is
the best copy available to publisher.

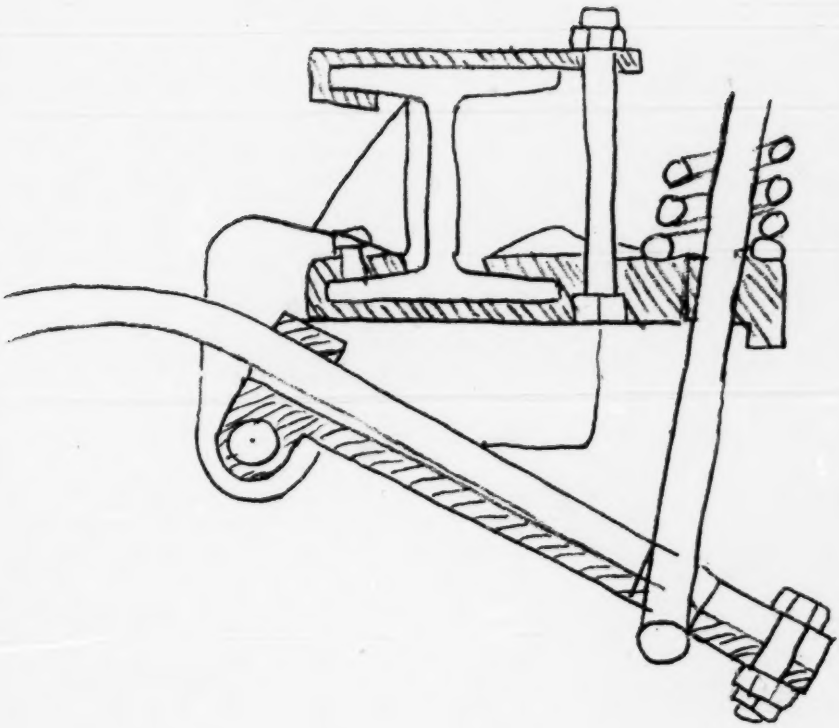
PLAINTIFFS' EXHIBIT U

649



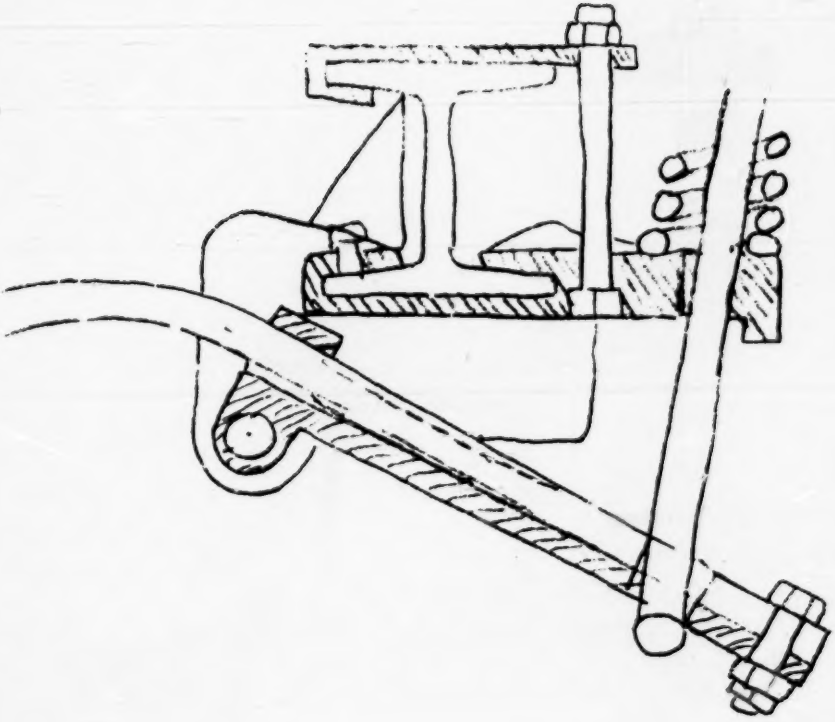
PLAINTIFFS EXHIBIT V

651



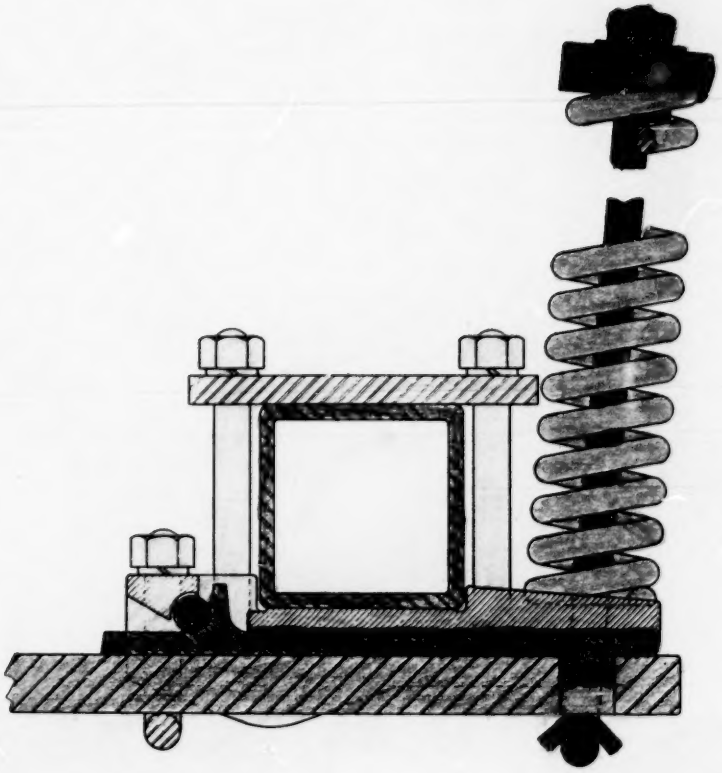
PLAINTIFFS' EXHIBIT W

653



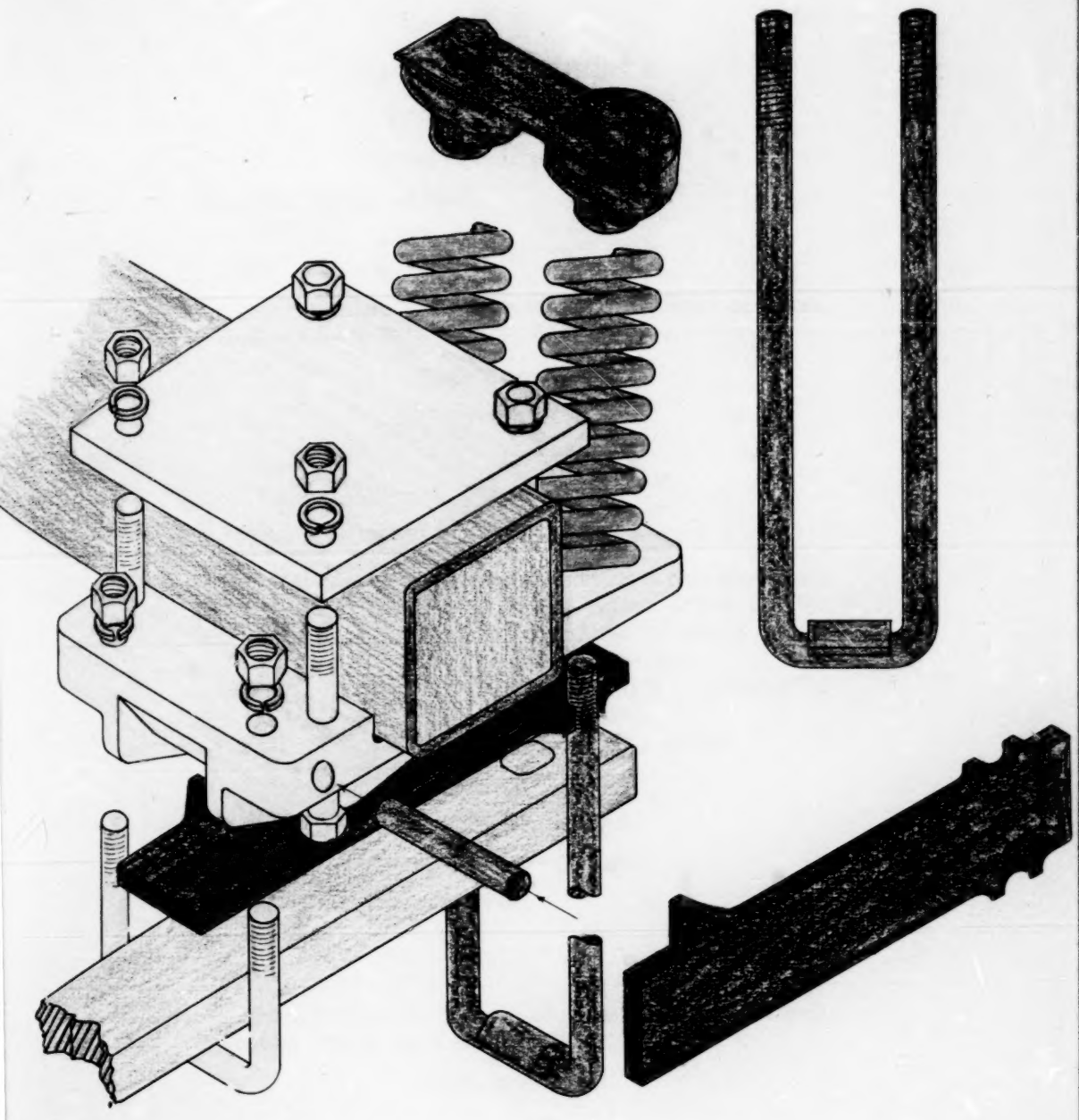
DEFENDANTS' EXHIBIT 1-A

655



DEFENDANTS' EXHIBIT 1-B

657



DEFENDANT'S EXHIBIT 4.

PATENT No. 2627798

Dated February 10, 1953

NUMBER (Series of 1948)
243893

DIV. ----------

Name William T. Graham of Amarillo, State of Texas, Invention Clamp for Vibrating Shank Plows.

Title Approved

/s/ APS
Examiner

Original

APPLICATION FILED COMPLETE, August 27, 1951

This is to certify that annexed hereto is a true copy from the records of the United States Patent Office of File Wrapper and Contents of the file identified above.

By authority of the
COMMISSIONER OF PATENTS
/s/ F. R. Oliver
Certifying Officer

Seal

Date March 21, 1962

PATENT No. 2627798

Dated February 10, 1953

NUMBER (Series of 1948)
243893

DIV. ----------

Name William T. Graham of Amarillo, State of Texas, Invention Clamp for Vibrating Shank Plows.

Title Approved

/s/ APS
Examiner

Original

APPLICATION FILED COMPLETE, August 27, 1951

Parts of Application Filed

34601

Petition, Specification Oath, First Fee $30 4 sheets Drawings,	August 27, 1951

Examined and passed for Issue December 3, 1952, A. Joseph Goldberg Exr. Div. 1.

Notice of Allowance December 3, 1952, by Commissioner.

Final Fee $30.00, January 6, 1953.

Attorney FISHBURN & MULLENDORE, 1216-17 COMMERCE TRUST BUILDING, KANSAS CITY 6, MISSOURI.

Associate Attorney _____

No. of Claims Allowed 2 Print Claim 1 in O. G. Glass 97-184.

FISHBURN, MULLENDORE & GOLD

Successors to
ARTHUR C. BROWN
Patent, Trademark & Copyright Causes
Suite 1217 Commerce Trust Building
Kansas City 6, Mo.
Telephone VIctor 1588

Claude A. Fishburn
Paul E. Mullendore
Orville O. Gold

August 24, 1951

Hon. Commissioner of Patents
Washington 25, D. C.

Sir:

Enclosed find necessary papers in the application of William T. Graham for patent on "Clamp for Vibrating Shank Plow", which were executed July 29, 1951.

Our check No. 2759 is also enclosed to cover, among other items, the filing fee of $30.

Acknowledgment of receipt is respectfully requested.

Respectfully submitted,

FISHBURN AND MULLENDORE
By /s/ Orville O. Gold

15,270

This invention relates to a plow of a type including ground conditiong tools that are carried on shanks having support on a mobile frame and which work under the surface to heave and break the soil and form alternate ridges and furrows having exposed surfaces composed of sod, straw and clods normally occurring on a field.

When the field contains rocks and other obstructions, it is desirable to mount the shanks of the ground working tools for rocking movement on the frame of the plow so that the ground working tools will pass freely over the obstructions and return to normal plowing position without injury to the plow.

It is therefore the principal object of the present invention to provide a simple and reliable mounting for attaching the shanks of the ground working tools to the mobile frame whereby the shanks may rock when necessary and vibrate under action when the plow is working in rocky and/or heavy soils. It is also an object of the invention to provide a mounting which includes a fixed part and a movable part pivotally connected with the fixed part and having a shank attaching portion to which the shank is rigidly secured and resiliently retained on the fixed part.

In accomplishing these and other objects of the invention hereinafter pointed out, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a vertical section through a frame member of a plow showing a mounting constructed in accordance with the present invention for resiliently attaching the shanks of the ground working tools whereby the shanks are

adapted to rock relatively to the frame when passing over an obstruction and return to normal position after the obstruction has been passed.

Fig. 2 is an enlarged longitudinal section through the frame member, the plow shank and the mounting by which the shank is pivotally connected with the frame member and resiliently held in normal plowing position, the section being taken on the line 2—2 of fig. 4.

Fig. 3 is a perspective view of the structure disclosed in Fig. 2.

Fig. 4 is a rear elevational view, with the shank being shown in cross section.

Fig. 5 is a front elevational view.

Fig. 6 is a longitudinal section similar to Fig. 2 but showing the shank and movable part of the mounting rocked relatively to the fixed part of the mounting.

Fig. 7 is a perspective view of the parts shown in disconnected and spaced relation to better illustrate the construction thereof.

Referring more in detail to the drawings:

1 designates a part of a plow frame to which the shanks 2 of the ground working tools 3 are attached by mountings generally indicated 4 and constructed in accordance with the present invention. Since all of the tool, shank and mounting assemblies are of like construction, only one of them is illustrated and described, it being understood that the plow may include one or more of the ground working devices.

The frame member 1, which composes a part of a plow frame, is illustrated as comprising an I-beam having upper and lower horizontally arranged flanges 5 and 6 that are interconnected by a vertical web 7. The shank 2 is formed of metal bar stock of substantially rectangular cross section and is of a width and thickness to provide the necessary strength and a certain amount of resiliency. The bar stock is shaped to provide a substantially straight end por-

tion 8 extending in the direction of travel of the machine and a rearwardly and downwardly curved portion 9 terminating in a forwardly curved end 10 to carry the ground working tool 3. The straight end 8 of the shank extends transversely with respect to the frame member 1 and is adapted to rock transversely relatively to travel of the plow.

Each mounting 4 includes a fixed part 11 and a movable part 12. The fixed part 11 has a substantially flat plate portion 13 substantially corresponding in length to the width of the lower flange 6 of the I-beam and which is closely engaged therewith by flanges 14 and 15 extending over the upper face of the lower flange 6, as best shown in Fig. 2. One of the flanges, for example the flange 14 preferably carries a set screw 16 that has its shank 17 threaded in an opening 18 of the flange to engage the upper face of the flange 6 and draw the plate portion 13 of the fixed part into engagement with the lower face of the flange and assure a firm connection with the I-beam.

Projecting forwardly from the plate portion 13 and flange 15 is a relatively thicker extension 19 provided with a slot-like opening 20 extending through a boss 21 that forms a spring seat 22. Depending from the under side of the plate portion 13 and extending forwardly of a portion of the extension 19 are flanges 23 and 24 spaced apart to form a downwardly opening channel or way 25 therebetween and in which the movable part 12 of the mounting is adapted to rock along with the forward end portion 8 of the Shank 2. Projecting rearwardly from the spaced flanges 23 and 24 are ears 26 and 27 that extend upwardly over the flange 14 and carry webs 28 that support abutments 29 which engage the rear face of the I-beam web 7 for distributing forces acting on the shank to the upper portion of the I-beam. The under side of the plate extension 19 may be reinforced by bosses 30 that extend forwardly on opposite sides of the channel or way 25, as shown in Figs. 5 and 7. It is obvious that the flange 14 of the fixed part is reinforced by the ears and webs 28. To reinforce the forward flange 15 the upper face of that flange and the extension 19 may be provided with spaced ribs 31 and 32, as best shown in Fig. 7.

In order to further attach the fixed part to the I-beam, the mounting may include a hook member 33 having a plate portion 34 that extends over the upper face of the upper I-beam flange 5 and which has an opening 35 aligning with an opening 36 in the forward extension of the fixed part to pass the shank 37 of a bolt 38, the head 39 of the bolt being countersunk within a recess 40 that is formed on the under face of the extension 19, as best shown in Figs. 2 and 6. The opposite end of the plate portion 33 has a downwardly and forwardly extending hook 41 that engages under the upper flange of the I-beam. The bolt 38 has a nut 42 threaded on the shank thereof to draw the parts tightly against the I-beam as shown in Figs. 2 and 6.

The ears 26 and 27 are provided above the level of the under face 43 of the plate portion 13 with registering openings 44 and 45 to mount the ends 46 and 47 of a transverse pin 48, the pin being retained in position by cotter pins 49 extending through suitable openings 50 in the projecting ends of the pin.

The movable part 12 includes an elongated plate portion 51 having a width to move freely within the channel or way 25 and the rear end has an upwardly extending transverse ear 52 that is provided with an opening 53 for passing the pin 48 to pivotally connect the movable part 12 with the fixed part 11. The plate portion 51 extends forwardly of the way and beyond the forward end of the extension 19 to accommodate an opening 54 that registers with a corresponding but slightly larger opening 55 in the end portion 8 of the shank 2 to pass a fastening device 56. The movable part also includes a depending loop 57 having a rectangular passageway 58 substantially conforming to the cross sectional shape of the end portion of the shank whereby the end portion 8 of the shank is passed therethrough and embraced by the loop portion to rock with the movable part on the pivot pin 48. The nut 56' of the bolt may be set up snug but is left sufficiently loose to permit slight longitudinal movement of the end portion of the shank relatively to the pivotal part of the clamp.

The plow shank and movable part 12 of the mounting are resiliently retained in normal position with the upper face 59 of the plate portion 51 in clamping engagement

with the under face 60 of the fixed part 11. This is effected by a resilient connection as now to be described. The end portion 8 of the shank and plate portion 51 of the movable part have elongated openings 61 and 62 that register with the slot-like opening 20 of the fixed part, as shown in Fig. 2. Extending through the registering openings 60, 61 and 20 is a rod 63 having a transverse head 64 on its lower end engaging under the end portion 8 of the plow shank. Sleeved over the rod and having one end engaging the spring seat 22 is a coil spring 65 having its upper end connected with the upper end of the rod by a washer-like spring seat 66 retained on the upper end of the rod by a nut 67, the nut being tightened on the rod to compress the spring 65 sufficiently to retain the shank 2 and movable part 12 in normal position but to allow rocking movement of the movable part when the shank is rocked. This rocking movement of the shank will cause the movable part 12 to pivot away from the fixed part 11 along with the forward end portion 8 of the shank 2 to effect compression of the spring 65 so that the stored up action in the spring will return the shank and movable part of the clamp to normal position with the plate portion 51 resiliently clamped against the fixed part 11 of the mounting as shown in Fig. 2.

In assembling the mounting, the fixed part 11 is slid over an end of the I-beam 1 and moved to the desired location thereon along with other of the mountings not shown. The hook member 33 is then placed over the upper flange 5 of the I-beam with the hook 41 engaged with the flange after which the bolt 38 is applied and the nut 42 tightened to draw the fixed part 11 tightly against the lower flange 6 of the I-beam. The set screw 16 may then be tightened to further secure the fixed part of the mounting. The end portion 8 of the plow shank 2 is then passed through the opening 57 of the loop portion of the movable part 12 until the opening 55 registers with the opening 54. The fastening device 56 is then inserted through the registering openings 54 and 55 to secure the shank to the movable part of the mounting. The movable part 12 and forward end 8 of the shank are then placed within the downwardly opening way 25 of the fixed part 11 and the pivot pin 48 is

passed through the openings 44, 45 and 53 in the registering ears 26, 27 and 52 after which the cotter pins 49 are inserted in the openings 50.

The rod 63 is then passed through the openings 61, 62, and 20 and the coil spring 65 is sleeved thereover to engage the seat 22. The spring seat 66 is then applied over the upper threaded end of the rod to engage the upper end of the spring after which the nut 67 is applied to compress the spring and draw the movable part 12 into clamping engagement with the fixed part 11, sufficient tension having been applied to normally retain the shank and tool 3 in plowing position.

When the plow is in operation the ground working tool 3 may engage an obstruction. However, the tool is free to ride over the top of the obstruction upon upward rocking movement of the shank 2, the shank moving with the movable part 12 of the mounting about the axis of the pivot pin 48 so that the forward end 8 of the shank moves downwardly to cause the rod 63 to further compress the spring 65 whereby the spring 65 is enabled to return the shank 2 and movable part 12 to their normal position after the ground working tool has passed over the obstruction.

During operation of the plow, there is also a vibratory or pumping movement of the ground working tool that acts to reduce the draft and facilitate operation of the ground working tool in plowing up and heaving the soil to form the ridges and furrows. The pumping action of the ground working tools work the fine soil downwardly to form the seed bed and the larger clods, straw and the other mulching materials are worked to the surface for covering the fine soil and serving as a mulch to preserve the moisture.

From the foregoing it is obvious that I have provided a plow structure wherein the shanks of the ground working tools are attached to the plow frame in a manner to permit the desired rocking action of the plow shanks in a simple and efficient manner and without producing destructive strains on the plow frame or excessive wear on the mounting parts.

What I claim and desire to secure by Letters Patent is:

1. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank of the ground working tool from the frame including a part adapted to be fixed to the frame and a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, means on the pivotal part embracing the end portion of the shank, and resilient means interconnecting said parts and engaging the end portion of the shank to hold the pivotal part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along said end portion of the shank and back to normal position with said plate portion in contact with the fixed part.

2. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank of the ground working tool from the frame including a part adapted to be fixed to the frame and a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, means connecting the end portion of the shank to said plate portion to pivot therewith, and resilient means connecting said parts to hold the pivotal part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along said portion of the shank and back to normal position with said plate portion in contact with the fixed part.

3. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank

of the ground working tool from the frame including a part adapted to be fixed to the frame and a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, said pivotal part having a face corresponding with the form of the end portion of the shank and provided with a loop for embracing said end portion of the shank to retain the end portion of the shank in contact with said face of the plate portion, and resilient means connecting said parts to hold the pivotal part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along with said end portion of the shank and back to normal position with said plate portion in clamping contact with the fixed part.

4. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank of the ground working tool from the frame including a part adapted to be fixed to the frame and a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, a loop extending from the pivotal part below said pivotal connection for embracing the end portion of the shank, a fastening device cooperating with said loop for securing the end portion of the shank to the plate portion, and resilient means connecting said parts to hold the pivotal part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along with said end portion of the shank and back to normal position with said plate portion in clamping contact with the fixed part.

5. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction,

a mounting for attaching and supporting the shank of the ground working tool from the frame including a part adapted to be fixed to the frame and a part pivotally mounted on the fixed part and having a shank attaching portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, said pivotal part having a portion embracing said end portion of the shank for retaining said end portion of the shank in contact with the shank attaching portion to pivot therewith, said end portion of the shank and said parts having registering openings spaced forwardly from the pivotal mounting, a coil spring having one end seated on one of said parts and a rod extending through said registering openings and having means on the ends thereof for respectively engaging the end portion of the shank and the other end of said spring to yieldingly hold the shank attaching portion of the pivotal part in contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along with said end portion and back to normal position with said shank attaching portion in clamping relation with the fixed part.

6. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank of the ground working tool from the frame including a part adapted to be fixed to the frame and a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, means for securing said end portion of the shank to the plate portion to pivot therewith, said end portion of the shank and said parts having registering openings spaced from the pivotal mounting, a coil spring having one end seated on one of said parts and a rod extending through said registering openings and having means on the ends thereof for engaging respectively the end portion of the shank and the other end of said spring to yieldingly hold the plate portion of the pivotal part in contact with

the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along the said end portion and back to normal position with said plate portion in contact with the fixed part.

7. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank of the ground working tool from the frame including a part adapted to be fixed to the frame and having spaced apart depending flanges to form a downwardly opening way to receive an end portion of the shank and having spaced apart ears extending rearwardly in substantially aligning registry with said flanges, said mounting also including a movable part having a transverse ear between said spaced apart ears of the fixed part and having a shank engaging portion extending in said way, a pivot pin extending through said spaced and transverse ears for pivotally connecting the movable part with the fixed part, means connecting the end portion of the shank to the shank attaching portion, and resilient means connecting said parts to hold the movable part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the movable part to move downwardly within said way along with said end portion of the shank and back to contact with the fixed part.

8. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank of the ground working tool from the frame including a part adapted to be fixed to the frame and having spaced apart depending flanges to form a downwardly opening way to receive an end portion of the shank and having spaced apart ears extending rearwardly from said flanges, said mounting also including a movable part having a transverse ear engaged between said spaced apart ears of the fixed part, a pivot pin extending through said spaced and

transverse ears for pivotally connecting the movable part with the fixed part, said movable part having a plate portion extending forwardly within said way and along the end portion of the shank, said movable part having a portion below said ears for embracing said end portion of the shank, said parts and end portion of the shank having registering openings, a rod extending through said openings and having a head engaging under the end portion of the shank, a coil spring having one end seated on the fixed part and having the other end connected with the rod to hold the movable part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the movable part to pivot away from the fixed part along with said end portion of the shank and back to normal position with said plate portion in clamping contact with the fixed part.

9. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank of the ground workng tool from the frame including a part adapted to be fixed to the frame and having spaced apart depending flanges to form a downwardly opening way to receive an end portion of the shank and having spaced apart ears extending rearwardly from said flanges, said mounting also including a movable part having a transverse ear engaged between said spaced apart ears of the fixed part, a pivot pin extending through said spaced and transverse ears for pivotally connecting the movable part with the fixed part, said movable part having a plate portion extending forwardly within said way and along the end portion of the shank, said movable part having a portion below said ears for embracing said end portion of the shank, a fastening device extending through said plate portion in the shank to cooperate with said embracing portion to secure the end portion of the shank to the plate portion of the movable part, said parts and end portion of the shank having registering openings, a rod extending through said openings and having a head engaging under the end portion of the shank, a coil spring having one end seated

on the fixed part and having the other end connected with the rod to hold the movable part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the movable part to pivot away from the fixed part along with said end portion of the shank and back to normal position with said plate portion in clamping contact with the fixed part.

10. A mounting for attaching and supporting the shank of a ground working tool to an I-beam frame member of a plow including a part adapted to be fixed to the lower flange of the I-beam and a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, means on the pivotal part embracing the end portion of the shank, resilient means interconnecting said parts and engaging the end portion of the shank to hold the pivotal part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along said end portion of the shank and back to normal position with said plate portion in contact with the fixed part, a plate member adapted to extend over the upper flange of the I-beam and having a hook portion engaging under said flange at the side of the I-beam, and a bolt connecting the plate member at the opposite side of the I-beam with the fixed part.

11. A mounting for attaching and supporting the shank of a ground working tool to an I-beam frame member of a plow including a part adapted to be fixed to the lower flange of the I-beam and a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, means on the pivotal part embracing the end portion of the shank, resilent means interconnecting said parts and engaging the end portion of the shank to hold the pivotal part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along

said end portion of the shank and back to normal position with said plate portion in contact with the fixed part, and an abutment on the fixed part above the pivotal mounting and adapted for engaging the web portion of the I-beam.

12. A mounting for attaching and supporting the shank of a ground working tool to an I-beam frame member of a plow including a part adapted to be fixed to the lower flange of the I-beam and a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part, means on the pivotal part embracing the end portion of the shank, resilient means interconnecting said parts and engaging the end portion of the shank to hold the pivotal part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along said end portion of the shank and back to normal position with said plate portion in contact with the fixed part, an abutment on the fixed part above the pivotal mounting and adapted for engaging the web portion of the I-beam, a plate member adapted to extend over the upper flange of the I-beam and having a hook portion engaging under said flange at the side of the I-beam above said abutment, and a bolt connecting the plate member at the opposite side of the I-beam with the fixed part.

SOLE

OATH, POWER OF ATTORNEY, AND PETITION

2834

Being duly sworn, I, William T. Graham depose and say that I am a citizen of the United States of America residing at Amarillo, in the County of Potter State of Texas; that I have read the foregoing specification and claims and I verily believe I am the original, first, and sole inventor of the invention or discovery in "CLAMP FOR VIBRATING SHANK PLOW" described and claimed therein; that I do not know and do not believe that this invention was ever known or used before my invention or discovery thereof, or patented or described in any printed publication in

any country before my invention or discovery thereof, or more than one year prior to this application, or in public use or on sale in the United States for more than one year prior to this application; that this invention or discovery has not been patented in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months before this application; and that no application for patent on this invention or discovery has been filed by me or my representatives or assigns in any country foreign to the United States, except as follows:

And I hereby appoint the firm of FISHBURN & MULLENDORE consisting of Claude A. Fishburn and Paul E. Mullendore, of Kansas City, Missouri, Registration No. 15448, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent Office connected therewith.

Wherefore I pray that Letters Patent be granted to me for the invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification and claims, oath, power of attorney, and this petition, this 29th day of July, 1951.

Inventor William T. Graham
First name / Middle initial / Last name

Post Office Address
c/o Graham-Hoeme Mfg. Co.
P. O. Box 2050
Amarillo, Texas

State of TEXAS)
) SS
County of POTTER)

Before me personally appeared William T. Graham, to me known to be the person described in the above application for patent, who signed the foregoing instrument in my presence, and made oath before me to the allegations

set forth therein as being under oath, on the day and year aforesaid.

/s/ F. W. Span
Notary Public

SEAL

My commission expires 6-1-'52.

This form may be executed only when attached to a complete application as the last page thereof.

Approved Single Signature Form
Sole Inventor
(No. 290)

Address all Communications to
FISHBURN & MULLENDORE

1216-17 Commerce Trust Bldg. Kansas City 6, Mo.

677

DIV. 1 243893

PRINT OF DRAWING AS ORIGINALLY FILED

Fig. 1.

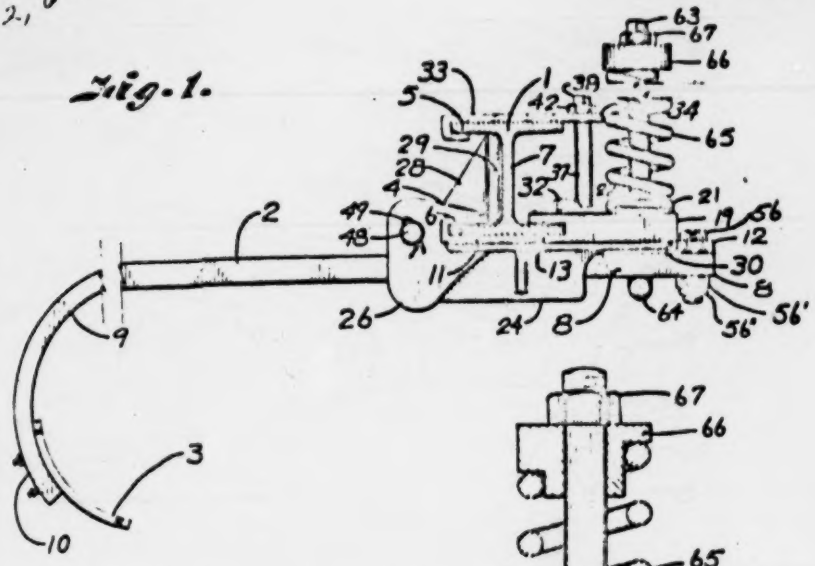
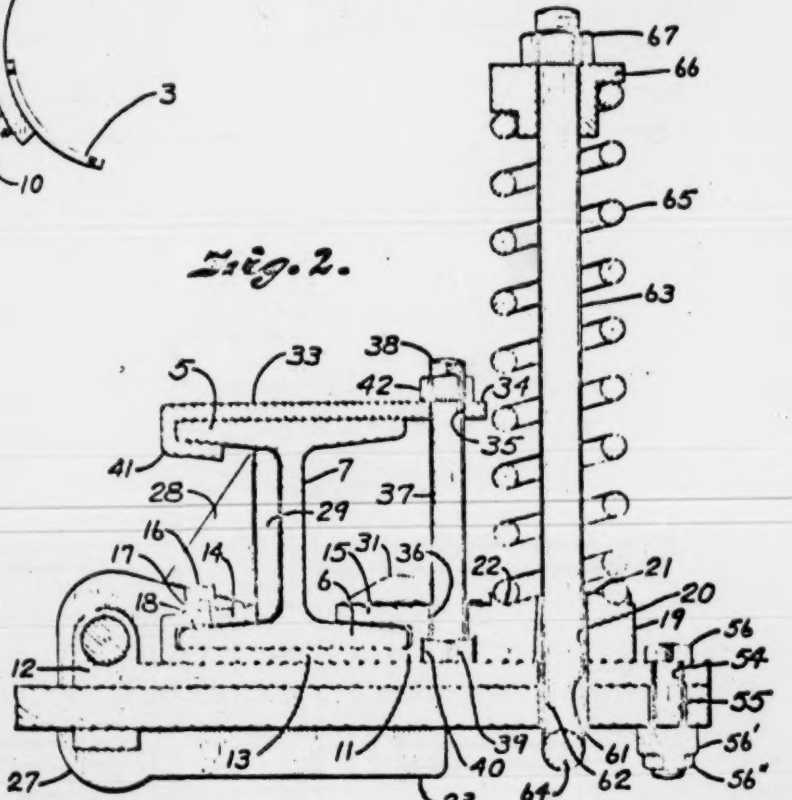


Fig. 2.



INVENTOR.
William T. Graham.
BY
Fishburn & Gallandore
ATTORNEYS.

DEC 3 1952

243893

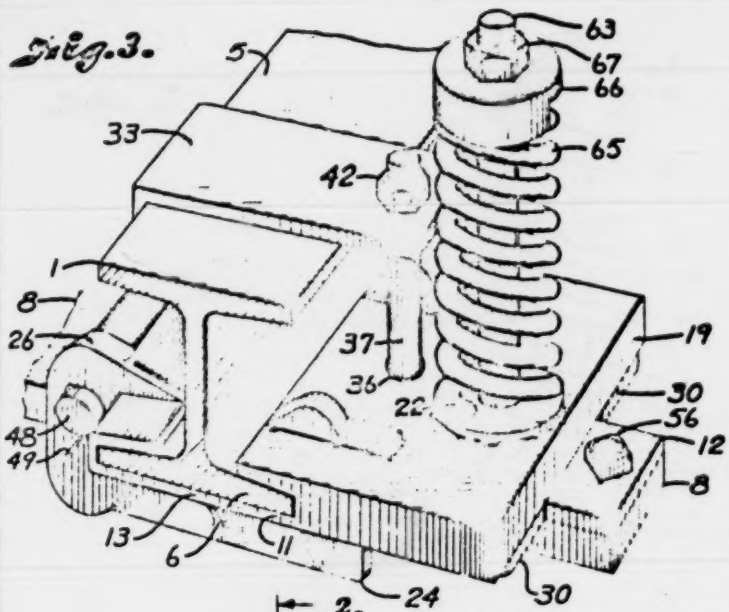
679

DIV. I

242893

PRINT OF DRAWING AS ORIGINALLY FILED

Fig. 3.



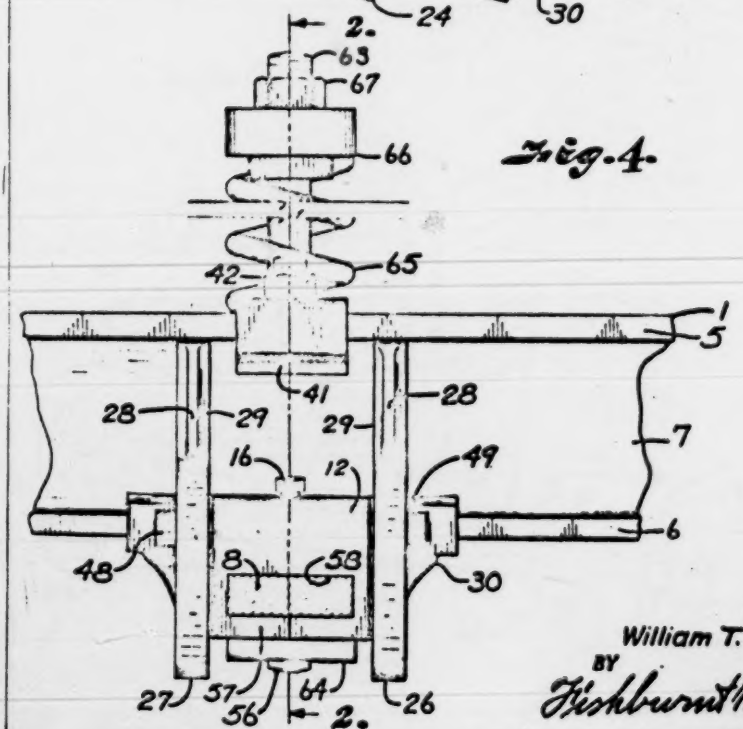


Fig. 4.

INVENTOR.
William T. Graham.
BY
Fishburn & Mullendore
ATTORNEYS.

243893

24

PRINT OF DRAWING AS ORIGINALLY FILED

Fig. 5.

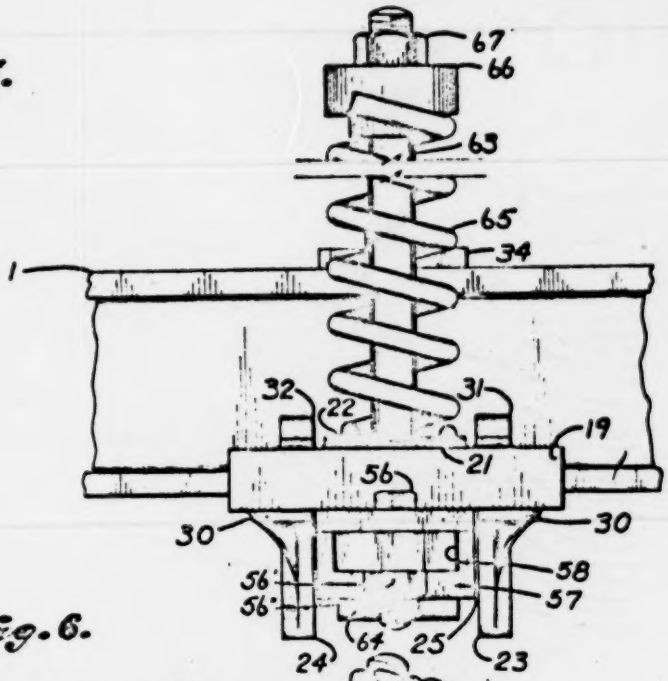
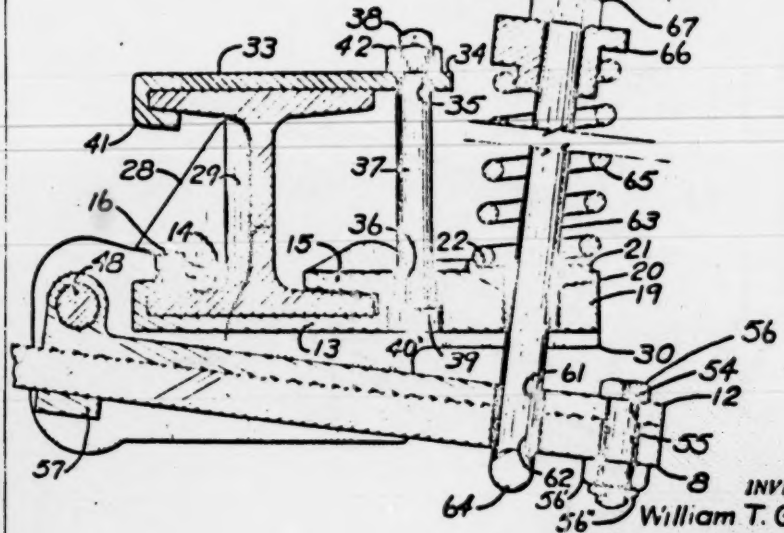


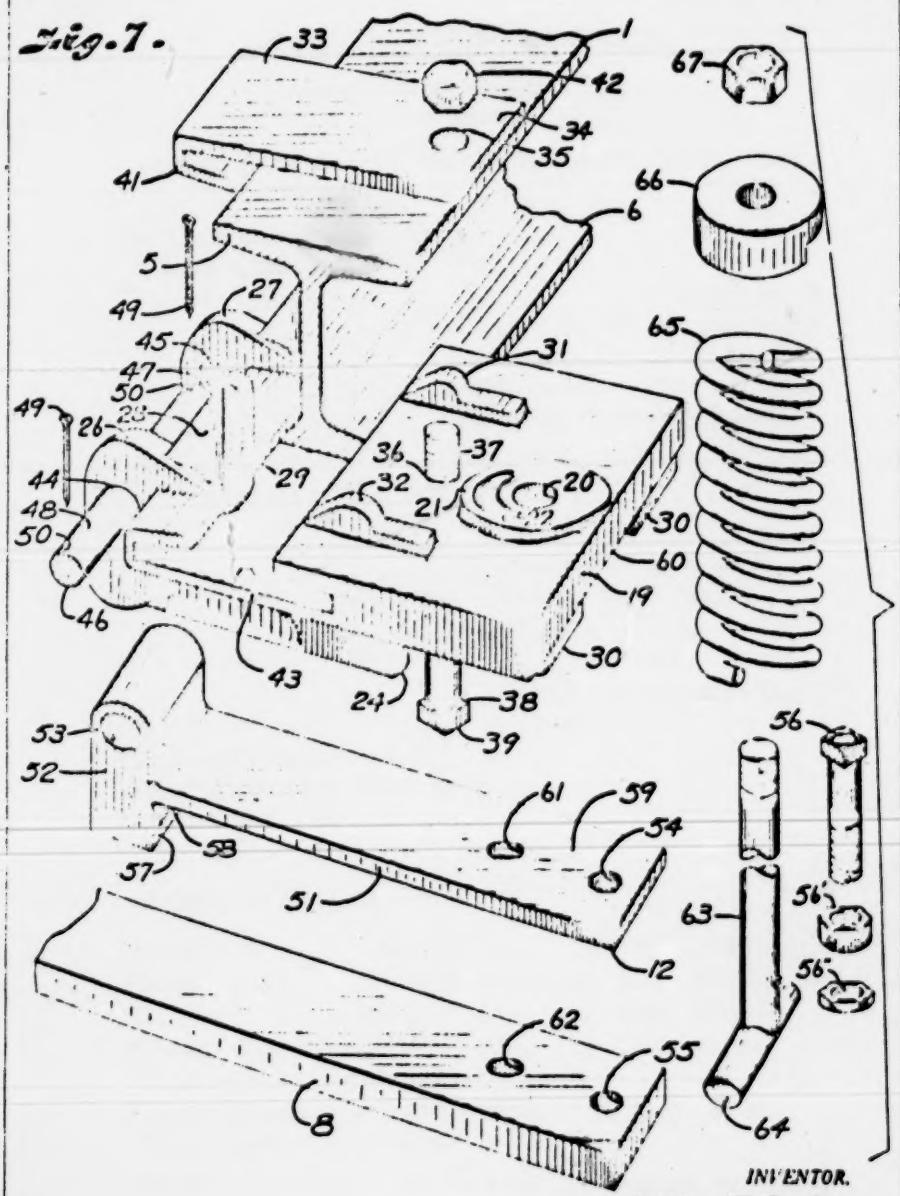
Fig. 6.



INVENTOR.
William T. Grahain.
BY
Fishburn & Mullendore
ATTORNEYS.

PRINT OF DRAWING AS ORIGINALLY FILED

Fig. 7.



INVENTOR.
William T. Graham.
BY
Fishburn & Mullendore
ATTORNEYS.

DEPARTMENT OF COMMERCE

United States Patent Office
WASHINGTON

(Mailed April 23, 1952, Patent Examining Division 1.)
Address only

The Commissioner of Patents
Washington 25, D. C.

Paper No. 3

All communications respecting this application should give the serial number, date of filing and name of the applicant.

Please find below a communication from the EXAMINER in charge of this application.

/s/ John A. Marzall
Commissioner of Patents

Applicant:	William T. Graham
Ser. No.	243,893
Filed	August 27, 1951
For	CLAMP FOR VIBRATING SHANK PLOW

Fishburn & Mullendore
1216-17 Commerce Trust Bldg.
Kansas City 6, Mo.

This application has been examined.

References made of record:

Drader et al	417,775	Dec.	24, 1889	55-36
Pfeifer	2,014,451	Sept.	17, 1935	97-Clamp-8
Graham	2,493,811	Jan.	10, 1950	97-184
Petersen (Denmark) (2 pgs. spec.; 1 sht. drwgs.)	57,391	Mar.	18, 1940	97-184
Traeger (Australia) (3 pgs. spec.; 1 sht. drwgs.)	111,910	Nov.	8, 1940	55-36

Claims 1 through 9 are rejected on Graham as failing to patentably distinguish therefrom. The expedient re-

versal of the relative positions of the elements 34 and 63 of Graham and the mere provision of a fastening means between the forward ends of said elements are considered matters of design well within the expected skill of the art and devoid of invention. Clearly no new or unexpected result is obtained by these expedient modifications within the scope of the combination.

Claims 1 through 9 are further rejected on Graham in view of Petersen and Drader. Petersen in the embodiment of elements 1 and 2, is relied upon to suggest the disposition of the Graham element 63 above the element 34. Drader, in the embodiment of the fastening means through elements E and D, is relied upon to suggest the use of fastening means in the forward ends of the Graham elements 34 and 63. In view of the teachings of Petersen and Drader, neither of the above changes in the Graham device are deemed to constitute invention.

Claims 10, 11 and 12 are rejected on Graham, for the same reasons advanced in the rejection of claims 1 through 9, in view of Pfeifer. To utilize the plate member 7 of Pfeifer on the Graham I-beam upper flange and connect said plate member to the Graham element 57 by means of the Pfeifer bolt means 10-11 is deemed to be well within the expected skill of the art and devoid of invention.

Claims 10, 11 and 12 are further rejected on Graham in view of Petersen and Drader, for the same reasons advanced in the rejection of claims 1 through 9 taken with Pfeifer. Pfeifer is relied upon for the same reasons set forth in the previous rejection of claims 10, 11 and 12.

Upon allowance of any claim revision as to form may be required. Rule 105.

All the claims are rejected.

/s/ O. L. Lewis
Acting Examiner

RFL:les

IN THE UNITED STATES PATENT OFFICE
—AMENDMENT—

(Mail Division Jul 2, 1952 U.S. Patent Office)

(U. S. Patent Office Jul 7, 1952 Division 1)

Div. 1

Inventor: William T. Graham
Invention: "CLAMP FOR VIBRATING SHANK PLOW"

Filed: August 27, 1951
Serial No. 243,893

Kansas City, Missouri

June 30, 1952

Hon. Commissioner of Patents
Washington 25, D. C.

Sir:

In response to Office Action of April 23, 1952, the above entitled application is hereby amended as follows:

Cancel the claims and substitute the following:

1. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for pivotally attaching and supporting the shank of the ground working tool to a transverse member of the frame, the mounting including a fixed member adapted to be fixed to the transverse member of the frame and having a longitudinally extending underface terminating forwardly of the transverse member to which said mounting is adapted to be fixed, the fixed member having ears extending rearwardly from said underface at the sides thereof, a shank attaching member having an elongated plate portion provided with an upper face corresponding with and normally in contact with said underface of the fixed member and provided with a longitudinally extending underface in engagement with a corresponding upper face of the shank whereby the plate portion of the shank

attaching member is between the shank and the fixed member, means connecting the elongated plate portion with the shank for maintaining the upper face of the shank in constant continuous contact with the underface of said plate portion of the shank attaching fixed member, a transverse pin pivotally connecting the shank attaching member to the fixed member at the rear ends of said normally contacting faces and whereon the shank attaching member pivots upon rocking movement of the shank, a coil spring having one end seated on the forward end of the fixed member, and means having connection with the forward end of the shank and with the other end of the coil spring whereby the spring yieldably maintains said normal contact of the upper face of the plate portion of the shank attaching member with the underface of the fixed member to maintain the normal plowing depth of the ground working tool.

2. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for pivotally attaching and supporting the shank of the ground working tool to a transverse member of the frame, the mounting including a fixed member adapted to be fixed to the transverse member of the frame and having a longitudinally extending underface terminating forwardly of the transverse member to which said mounting is adapted to be fixed, the fixed member having ears extending rearwardly from said underface at the sides thereof, a shank attaching member having an elongated plate portion provided with an upper face corresponding with and normally in contact with said underface of the fixed member and provided with a longitudinally extending underface in engagement with a corresponding upper face of the shank whereby the plate portion of the shank attaching member is between the shank and the fixed member, said shank attaching member having a lug extending upwardly between said ears of the fixed member and disposed at the rear end of the plate portion and above the plane of the underface of the fixed member, said shank attaching member having depending means embracing the shank at the rear end of said plate portion, a bolt connecting the forward end of the plate portion with

the forward end of the shank and cooperating with the shank embracing means in maintaining the upper face of the shank in constant continuous contact with the underface of said plate portion, a pivot pin extending transversely through said lug and carried by the ears with the axis thereof above the plane of the underface of the fixed member whereby the normally contacting face of the shank attaching member immediately moves out of contact with and away from the face of the fixed member when the shank attaching member pivots upon rocking movement of the shank, a coil spring having one end seated on the forward end of the fixed member, and means having connection with the forward end of the shank and with the other end of the coil spring whereby the spring yieldably maintains said normal contact of the upper face of the plate portion of the shank attaching member with the underface of the fixed member.

REMARKS:

Applicant's counsel wishes to express appreciation of the courtesy of the Assistant Examiner for kindly granting interviews in connection with this application on June 10 and 12, and also for the interview which the Primary Examiner granted on the latter date.

At the first of the interviews the Examiner's rejection of the claims on applicant's patent was discussed. It was pointed out that the present construction is an improvement over the structure disclosed in applicant's patent. The patented structure has proved a highly commercial success and has made this type of plow satisfactory for substantially all plowing conditions. It was found, however, that wear occurred between the shank and the fixed part of the clamp where the fulcrum shifted from the pin to that portion of the fixed part of the clamp directly at the rear end of the clamping face thereof. It was pointed out that the present construction avoided this wear by inserting the movable part between the plowing shank and the fixed part and by locating the pivot to avoid rubbing contact of the pivoted part with the fixed part of the clamp. With this arrangement the vibratory movement of the

shank acted on the pivoted part or shank attaching member of the clamp. This shifting of the wear point to the pivoted part facilitates repair and replacement when wear does occur.

In applicant's patent where the wear is on the fixed part it requires replacement of the fixed part, which part is substantially larger and therefore is far more expensive to replace than the smaller pivoted part. The fixed part is also more difficult to replace because the beam of the frame to which the plow shanks are attached must be removed to take off a worn fixed part of the clamp and replace it with a new part.

In the present structure, it is only necessary to remove the pivot pin and disconnect the pivoted part from the shank. These operations are accomplished without disturbing any of the other shank mountings which do not need to be replaced.

After this feature was pointed out to the Examiner he stated that his ground for rejection on applicant's patent set out in the first paragraph of the Office Action would be withdrawn. However, the Examiner believed that the Danish patent to Petersen disclosed the idea of mounting the pivoted part of a clamp between the shank and the fixed part. It was then pointed out that the pivot and intercontacting parts have a different relationship than the pivot and contacting faces of applicant's present clamp. The mounting of the Danish patent, as well as the contact points between the fixed and pivoted parts, have a different relationship with respect to the plow frame and to the portion of the plow shanks.

An Official Patent Office translation of the Danish patent indicates a different kind of plow. The members 1 are described as hoe teeth and the teeth are mounted vertically so that they are adjustable in height by means of the screw bolts 6. The contact faces of the mounting parts and the end of the shank are therefore vertically transverse to the movement of the horse hoe on which the mountings are used. It was also pointed out that it was the point 17 which moved into contact with the clamp part 18 to form a stop. Consequently due to the location of the pivot 16 this point would rub against and wear the fixed part.

This is confirmed by the translation which states: "The part 2, which rotates on a bolt 16 passed through the lateral cheeks 8, *has a beak 17 at the front,* which by engaging on the part 18 of the front wall carried back of the machine frame 3 stops the movement of the part 2, when the latter is pressed back by the spring 9." Applicant's mounting has no beak. The contacting faces of applicant's device extend substantially the full length of the mounting and no one portion of one face contacts the other face before other portions come into contact. Consequently the stop faces are not even equivalent to a beak. In the Danish patent the bolt or pivot 16 is between the tooth 1 and the face carrying the beak 17.

The Petersen patent is a foreign reference and if the disclosure therein suggests any modification of applicant's patented structure then the disclosure in the Danish patent to Petersen must be used in its entirety and not reconstructed to negative applicant's present invention. With this in mind the use of the mounting disclosed in the Danish patent as taught by applicant's patent would result in a structure wherein the pivoted part might be between the shank and the fixed part, but the pivot bolt 16 and beak 17 would be present in the hypothetical structure and have the same relationship as disclosed in the Danish patent. The hypothetical structure would also have a single attaching means for the shank and this attaching means would have the same relationship to the pivot bolt 16 and beak 17 and part 18 as disclosed in the Danish patent. Certainly the shank would not be connected with the pivoted part at the respective ends of the intercontacting portions of the clamp parts.

The disclosure in the Australian patent to Traeger was also discussed and it was pointed out that the shank 2 would have rubbing contact with the eye 4 on the fixed part of the clamp and that it did not suggest mounting of the plate portion of the pivoted part of the clamp between the shank 2 and the part 1. The Examiner agreed that this patent did not disclose the present invention.

The present claims, which are two in number, have been substituted for the original claims to better bring out the present invention and distinguish from any hypothetical

structure resulting from modification of applicant's patented structure as taught by the Danish patent to Petersen.

At the interview on the 12th the present claims were discussed and it was pointed out that they patentably distinguish from the structure disclosed in applicant's patent as well as from any hypothetical structure that might result from the teaching disclosed in the Danish patent.

Claim 13 distinguishes from the references by defining a fixed member having a longitudinally extending underface terminating forwardly of the transverse member to which the mounting is adapted to be fixed and a shank attaching member having an elongated plate portion provided with an upper face corresponding with and normally in contact with said underface of the fixed member and provided with a longitudinally extending underface in engagement with the corresponding upper face of the shank. This is certainly not the case of the faces of the fixed and pivoted clamping members of applicant's patent and as above pointed out such relationship of the contact faces would not result from modification of applicant's patented structure in view of the disclosure of the Danish patent. The claim also distinguishes by bringing out means connecting the elongated plate portion with the shank for maintaining the upper face of the shank in constant continuous contact with the underface of the plate portion of the fixed member.

The claim further distinguishes from the hypothetical structure by specifying a transverse pin pivotally connecting the shank attaching member to the fixed member at the rear ends of said normally contacting faces.

Claim 14 more specifically distinguishes from the references by defining the fixed member as having ears extending rearwardly from the underface at the sides thereof and that the shank attaching member has a lug extending upwardly between the ears of the fixed member and disposed at the rear end of the plate portion and above the plane of the underface of the fixed member.

The claim further distinguishes by specifying that the shank attaching member has depending means embracing the shank at the rear end of the plate portion (which is

certainly not the case of the tooth embracing means of the Danish patent), and by specifying a bolt connecting the forward end of the plate portion with the forward end of the shank.

The Examiner cited the Drader et al. patent to show that there is no invention in using a fastening device and that such a fastening device might be applied at the forward end of the hypothetical mounting as constructed from applicant's patent in accordance with the disclosure of the Danish patent. It is believed that the Examiner concedes that this is an improper rejection because neither of the principal references suggest connection of the forward ends of the shanks with the forward end of the pivoted plate portion and particularly when such connection is used with an embracing means at the opposite end of the interengaging face portions of the respective mounting members.

The upper clamp member is not included in the present claims and, therefore, the Drader et al. patent is not applicable to the present claims.

It is understood that it is the Examiner's thought that in the absence of a closer reference the two claims submitted herewith are patentable.

Favorable action is respectfully solicited.

Respectfully submitted,

FISHBURN AND MULLENDORE
Attorneys
By: /s/ Paul E. Mullendore

PEM/hf

DEPARTMENT OF COMMERCE

United States Patent Office
WASHINGTON

(Mailed November 14, 1952, Pat. Div. 1.)

Address Only

The Commissioner of Patents
Washington 25, D.C.

Paper No. 5

All communications respecting this application should give the serial number, date of filing, and name of the applicant.

Please find below a communication from the EXAMINER in charge of this application.

/s/ John A. Marzall
Commissioner of Patents.

Applicant:	William T. Graham
Ser. No.	243,893
Filed	Aug. 27, 1951
For	CLAMP FOR VIBRATING SHANK PLOW

Fishburn and Mullendore
1216-17 Commerce Trust Bldg.
Kansas City 6, Mo.

Responsive to amendment filed July 2, 1952.

No reference can be found in the specification to the nut 56" shown in the drawings.

Claim 13 is rejected as being inaccurate. The upper face of the shank is not disclosed as being "in constant continuous contact with the underface of said plate portion of the *fixed* member" as recited in lines 20-21. Should not "fixed" be changed to—shank attaching—?

Claim 14 appears allowable.

Claim 13 would appear to be allowable if amended as suggested above.

/s/ A. Joseph Goldberg
Examiner

RFL
Lip: wm

(Mail Division November 18, 1952, United States Patent Office.)

(United States Patent Office November 18, 1952,

Division 1.)

IN THE UNITED STATES PATENT OFFICE

—AMENDMENT—

Div. 1

Inventor: William T. Graham

Invention: "CLAMP FOR VIBRATING SHANK PLOW"

Filed: August 27, 1951
Serial No. 243,893

November 18, 1952

Hon. Commissioner of Patents
Washington 25, D. C.

Sir:

In response to Office action of November 14, 1952, the above entitled application is hereby amended as follows:

Page 6, after the sentence ending in line 14, insert—The nut 56' is backed by a jam nut 56" to prevent turning thereof after the nut 56' has been set.—

Claim 13, line 21, cancel "fixed" and insert—shank attaching—.

REMARKS

The specification has been amended to include an explanation for the nut 56" that is shown in the drawings.

Claim 13 has been amended as suggested by the Examiner.

It is understood that with the above corrections the case is in condition for formal allowance of Claims 13 and 14.

Respectfully submitted,

FISHBURN & MULLENDORE
Attorneys
By /s/ Paul E. Mullendore

Lippitt:wm

Ser. No. 243,893
Paper No. 37

REFERENCES CITED

The following references are of record in the patented file of this patent: 2833

UNITED STATES PATENTS

Name	Number	Date
Drader et al	417,775	Dec. 24, 1889
Pfeifer	2,014,451	Sept. 17, 1935
Graham	2,493,811	Jan. 10, 1950

FOREIGN PATENTS

Country	Number	Date
Denmark	57,391	Mar. 18, 1940
Australia	111,910	Nov. 8, 1940

OTHER REFERENCES

DEPARTMENT OF COMMERCE
United States Patent Office
Washington
(Mailed Dec. 3, 1952, Pat. Div. 1)

Address Only
The Commissioner of Patents
Washington 25, D. C.

All communications respecting this application should give the serial number, date of filming, and name of the applicant.

Fishburn and Mullendore
1216-17 Commerce Trust Building
Kansas City 6, Mo.

NOTICE OF ALLOWANCE

The application for patent identified below has been examined and found allowable for issuance of Letters Patent.

Applicant William T. Graham

Title of Invention or Improvement CLAMP FOR VIBRATING SHANK PLOW

Serial No.	Filing Date	Number Claims Allowed
243,893	Aug. 27, 1951	2

With the allowance of the application the final fee becomes due. This fee is thirty dollars ($30) plus one dollar ($1) for each claim allowed in excess of twenty (20) and must be paid within 6 months from the date of this notice. Failure to remit the final fee will result in the patent being withheld from issue. In remitting this fee identify the application to which it applies by giving the following information: Name of inventor, title of invention, serial number, date of filing, date of allowance, and if assigned, the names of the assignees. The final fee will not be received from anyone other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office.

If it is desired to have the patent issued to an assignee or assignees, an assignment, together with the fee for recording the same, must be filed in this Office on or before the date of payment of the final fee.

The patent will be issued and forwarded approximately five weeks after receipt of the final fee.

By direction of the Commissioner.

A. J. Goldberg
Examiner

FISHBURN, MULLENDORE & GOLD
Successors to
ARTHUR C. BROWN
Patent, Trademark & Copyright Causes
Suite 1217 Commerce Trust Building
Kansas City 6, Mo.
(Mail Division January 6, 1953, United States Patent Office.)

Claude A. Fishburn
Paul E. Mullendore
Orville O. Gold

Telephone VIctor 1588

January 5, 1953

Hon. Commissioner of Patents
Washington 25, D. C.

Sir:

Enclosed herewith find our check No. 3881 to cover, among other items, the final government fee of $30.00 in the application of William T. Graham for patent on "Clamp for Vibrating Shank Plow", Serial No. 243,893, filed August 27, 1951, and allowed December 3, 1952.

Acknowledgment of receipt is respectfully requested.

Respectfully submitted,

Fishburn and Mullendore
Attorneys
By: /s/ Claude A. Fishburn

CAF/st

AO Form 120 (Rev. Oct. 1954)

699

8

In Re Patents

United States District Court

for the

(N. Dist. Texas)

SOLICITOR

SEP 28 1959

U. S. PATENT OFFICE

COMMISSIONER OF PATENTS,
Washington 25, D. C.

SIR:

In compliance with the Act of July 19, 1952 (66 Stat. 814; 35 USC 290), you are advised that there was filed on the 24th day of September, 19 59, in this court an action, No. 12538, entitled:

Name William T. Graham & Graham Plow, Inc., Plaintiff,

Address Amarillo, Texas

versus

Name John Deere Company of Kansas City, Defendant,

Address Kansas City, Missouri

brought upon the following patents:

	PATENT NO.	DATE OF PATENT	PATENTEE
1	2,627,798	Feb. 10, 1953	William T. Graham
2			
3			
4			
5			

In the above-entitled case, on the day of , 19 , the following patents have been included by (insert amendment, answer, cross bill, or other pleading):

	PATENT NO.	DATE OF PATENT	PATENTEE
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or judgment issued:

J. C. TIDMAN
Clerk.

Date September 25, 1959

By Virgil B. Cook
Deputy Clerk.

701

INDEX OF CLAIMS

DATE		DATE	
1		61	
2		62	
3		63	
4		64	
5		65	
6		66	
7		67	
8		68	
9		69	
10		70	
11		71	
12		72	
13	a	73	
14		74	
15		75	
16		76	
17		77	
18		78	
19		79	
20		80	
21		81	
22		82	
23		83	
24		84	
25		85	
26		86	
27		87	
28		88	
29		89	
30		90	
31		91	
32		92	
33		93	
34		94	
35		95	
36		96	
37		97	
38		98	
39		99	
40		100	
41		101	
42		102	
43		103	
44		104	
45		105	
46		106	
47		107	
48		108	
49		109	
50		110	
51		111	
52		112	
53		113	
54		114	
55		115	
56		116	
57		117	
58		118	
59		119	
60		120	

SEARCHED

Class	Sub	Date	Ex'r
97	184	3-31-52	Lip
	183		
55	96		
	97		

SYMBOLS	STATUS
/	Rejected
=	Allowed
– (Through numeral)	Canceled
+	Division requirement
N	Nonelected invention or species
I	Interference
A	Appeal

46

Division of App., No. ..... , filed .....

2389[illegible]

703

ypm.

CONTENTS

1. Application papers. Sept 1 1951
2. Mail APR 23 1952
3. Rejection
4. Amdt & Response
5. Rejection NOV 1 1 1952
6. Amdt Nov. 10, 1952
7. List of Interviews
8. Notice of Suit SEP 2 4 1959
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.
25.
26.
27.
28.
29.
30.
31.
32.
33.
34.
35.
36.
37.
38.
39.
40.
41.
42.
43.
44.
45.
46.
47.
48.
49.
50.

16—11376-7 U. S. GOVERNMENT PRINTING OFFICE

24,393
45

U. S. PATENT OFFICE
SEP 10 1951
DIVISION 1

47

RECEIVED
WASHINGTON
SEP 7 1951

DEFENDANTS' EXHIBIT 5

PATENTS CITED BY PATENT OFFICE

707

(No Model.)

J. DRADER & A. B. McKAY.

CULTIVATOR TOOTH.

No. 417,775. Patented Dec. 24, 1889.

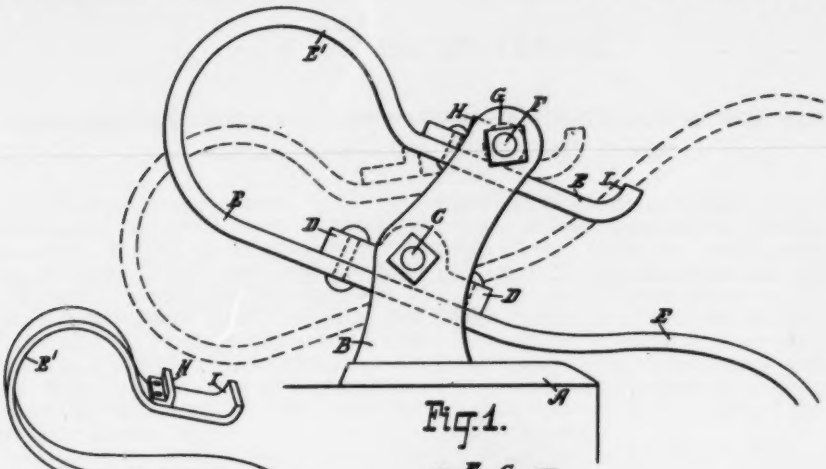


Fig. 1.

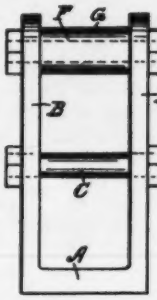


Fig. 3.

Fig. 4.

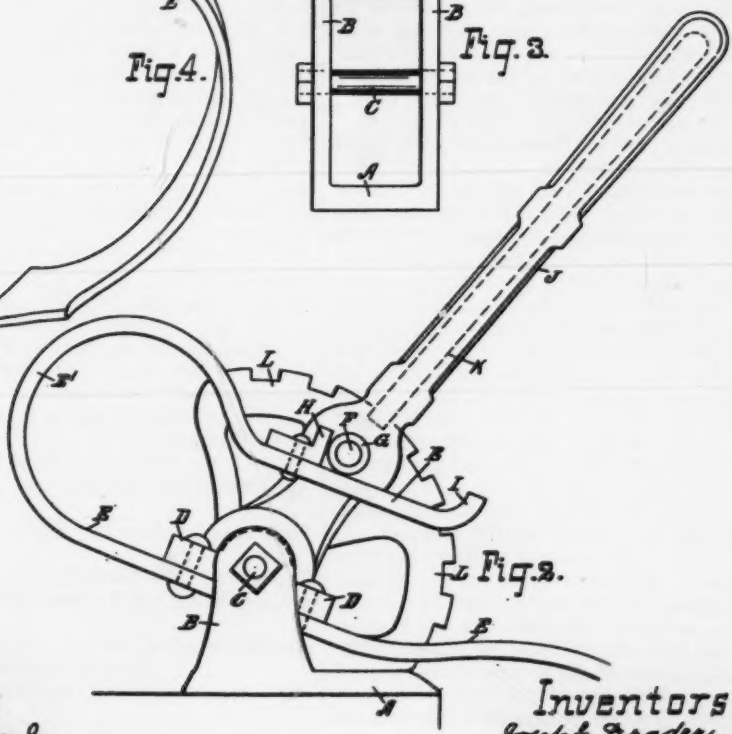


Fig. 2.

Attest
A. Edmunds
Carl Hayden

Inventors
Joseph Drader,
and Alex. B. McKay
by P. J. Edmunds
Atty

UNITED STATES PATENT OFFICE

709

JOSEPH DRADER AND ANDREW B. McKAY, OF LONDON, ONTARIO, CANADA; SAID McKAY ASSIGNOR TO SAID DRADER.

CULTIVATOR-TOOTH.

SPECIFICATION forming part of Letters Patent No. 417,775, dated December 24, 1889.

Application filed May 15, 1889. Serial No. 310,831. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH DRADER and ANDREW B. McKAY, both subjects of the Queen of Great Britain, and both residents of the city of London, in the Province of Ontario, Canada, have jointly invented certain new and useful Improvements on Cultivator-Teeth, of which the following specification, taken in connection with the accompanying drawings, forms a full, clear, and exact description.

This invention consists of a cultivator-tooth pivotally secured to the frame of the implement, the upper returned end of which tooth engages with a pin or stud for the purpose of holding the tooth in the ground, and at the same time permit the tooth to raise and free itself automatically from a root, stone, or other unyielding obstruction, and then automatically return the tooth to its original position after it frees itself from said obstruction, as will be hereinafter first fully set forth and described, and then pointed out in the claims, reference being had to the accompanying drawings, already referred to, wherein—

Figure 1 is a side elevation of a device embodying our invention. Fig. 2 shows a modification of same. Fig. 3 is an end view of Fig. 1 with the tooth removed. Fig. 4 is a perspective view of one form of a cultivator-tooth. In this view the stop is also shown.

A designates a plate, which is rigidly secured to the frame of the implement.

B B are standards rigidly secured to or formed integral with the plate A.

C is a pivot stud or pin secured in the bearings B B.

D is a clip pivotally secured to said stud or pin C.

E is a spring-tooth formed with a returned portion E′, and this tooth E is rigidly secured to the clip D.

F is a stud or pin secured in the standards B B or other suitable support.

G is an anti-friction roller encircling the stud or pin F.

H is a stop rigidly secured to the tooth E, or it may be in the form of a shoulder integral with the tooth E.

I is a curved shoulder at the extreme upper end of the tooth, which prevents the stud or pin F from disengaging from the returned end of said tooth, and which, with the stop H, limits the movement of said tooth.

In the modification shown in Fig. 2, J designates a lever pivoted on the stud or pin C; K, a spring-actuated dog pivoted on the lever J and adjusted to engage with recesses or notches in the segment L, the latter being rigidly secured to the plate A or other suitable support.

When the returned end of the spring-tooth E is compressed and held by the stud or pin F, the latter is adjusted to one side of the pivot stud or pin C and toward the rear of the tooth, as shown in Fig. 1. When in this position, the compression of the returned part E′ of the tooth on the stud or pin F not only holds the stop H against said stud or pin F or the anti-friction roller G thereon, but also firmly holds the lower end of the tooth E in the ground for the purpose of cultivating the same; and when the point of the tooth E comes in contact with an unyielding obstruction—such as a root or stone—the greatly-increased pressure of this unyielding obstruction on the point of the tooth overcomes the pressure of the returned end of the tooth on the stud or pin F and permits the point of the tooth to rise automatically to free itself from the obstruction, and, the stud or pin F being adjusted eccentrically in relation to the curved returned end E′ of the tooth E and toward the rear of the tooth, as the point of the tooth is raised the returned end of the tooth, extending beyond the stud or pin F toward the rear of the tooth, is inclined upward, and as the point of the tooth is further raised to pass over the unyielding obstruction, the returned portion of the tooth, between the pivot stud or pin C and the stud or pin F, is slightly lowered in the direction of the arc of a circle of which the pivot stud or pin C is the center; but, the outer end of the returned part of the tooth being held by the eccentrically-arranged stud or pin F from moving in the same direction, the upwardly-inclined returned end of the tooth is moved under the stud or pin F toward the front of the tooth, but the stud or pin F is prevented from disengaging therefrom by

the shoulder I. This compresses the returned end of the tooth and the rear part of the tooth between the point and the pivot stud or pin C together. This moves the stop II away from the stud or pin F and greatly increases the compression of the returned end of the tooth on the stud or pin F, so that when the tooth frees itself from the obstruction this increased compression of the returned end of the tooth on the stud or pin F is sufficient to immediately project the tooth in the ground again to its normal working position, which is regulated by the stop II abutting against the stud or pin F or anti-friction roller G thereon, and the effect of this strain on the point of the tooth when coming in contact with and passing over an unyielding obstruction will not injuriously affect the tooth, from the fact that from this construction this strain will be expended to a great extent by the yielding or springing of the tooth between its point and the pivot stud or pin C and between the latter and the stud or pin F.

Our invention illustrated in Fig. 1 is intended to be secured to the frame of the implement, and when required to move this implement along the road or from one field to another it will be necessary to raise the frame of the implement in order to adjust the teeth secured thereto clear above the ground; but when it is not convenient to raise the frame of the implement we rigidly secure the stud or pin F to a lever J, (shown in Fig. 2,) and, as before described, provide this stud or pin F with an anti-friction roller G, which engages with the stop H on the returned end of the tooth E, as also before described, and we pivot this lever J on the stud or pin C and secure a recessed or notched segment L to the plate A or other suitable support, and on the lever J we pivot the spring-actuated dog K and adjust it to engage with the notches or recesses in the segment L, so that when using this form of construction, by grasping and operating the lever J, the operator is enabled to raise the tooth E clear above the ground or to any required position in the ground, according to the direction and distance said lever is operated, and when the lever J and tooth E are adjusted to the required position they are securely held at that point by engaging the spring-actuated dog K with notches or recesses in the segment L.

By adjusting and holding the lever J at a lower point on the segment L the point of the tooth not only enters the ground a greater distance, but the returned end E′ of the tooth is further compressed by the stud or pin F, and the rigidity of the tooth in the ground is increased, because the pressure of the returned end E′ of the tooth on the stud or pin F is increased. This would be necessary in cultivating hard or stiff ground. The same result would be attained by adjusting the pin F lower in its bearings, or by adjusting said pin in its bearings to a point toward the rear of the tooth.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A pivotal cultivator-tooth E, having returned end E′, stop H, and a stud or pin C, in combination with the stud or pin F, provided with an anti-friction roller G, and said studs or pins supported in suitable bearings, substantially as shown and described, and for the purpose set forth.

2. A pivotal cultivator-tooth E, having a returned end E′, stop H, pivot stud or pin C, and bearings B, in combination with the stud or pin F, anti-friction roller G, and lever J, and means for holding said lever at the position to which it is adjusted, substantially as shown and described, and for the purpose set forth.

In testimony whereof we affix our signatures in the presence of the two undersigned witnesses.

JOSEPH DRADER.
ANDREW B. McKAY.

Witnesses:
P. J. EDMUNDS,
A. EDMUNDS.

711

Sept. 17, 1935. W. PFEIFER, JR 2,014,451

FASTENING DEVICE

Filed March 30, 1933

Fig. 1.

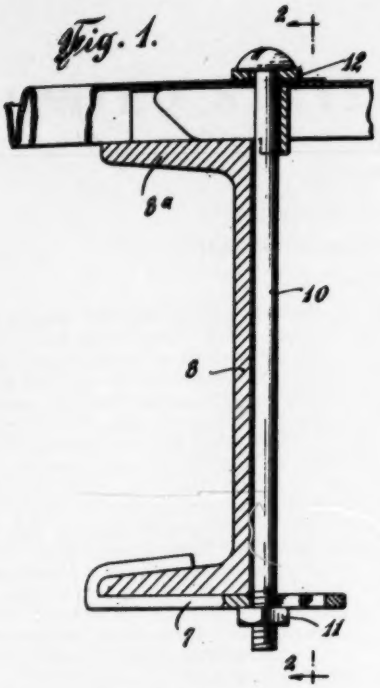


Fig. 2.

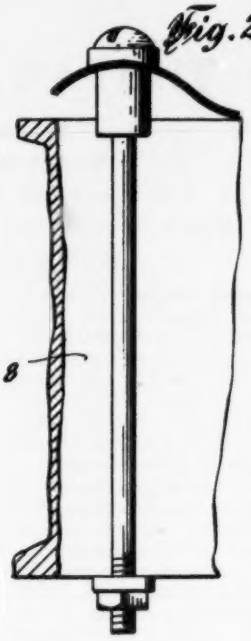


Fig. 6.

Fig. 5.

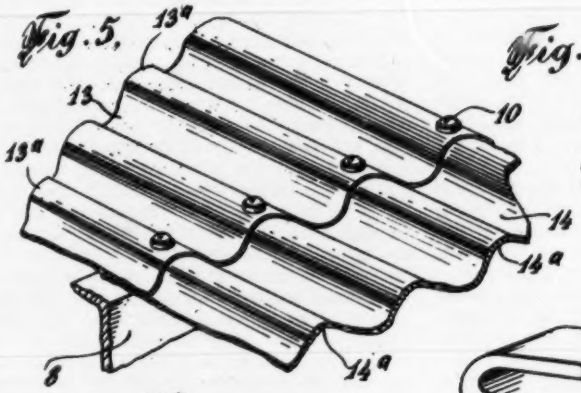
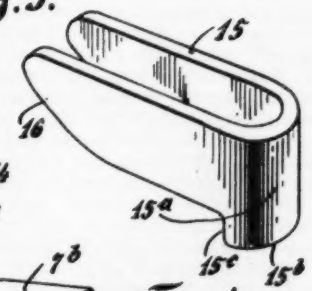


Fig. 3.



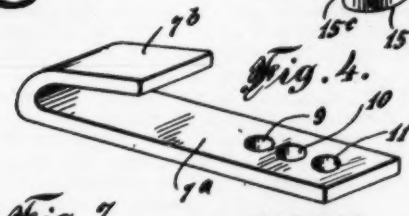


Fig. 4.

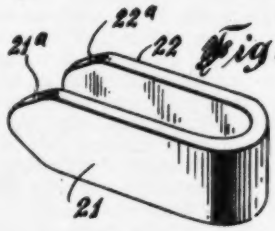


Fig. 8.

Fig. 7.

INVENTOR
WILLIAM PFEIFER, JR.,
BY
ATTORNEY

Patented Sept. 17, 1935 2,014,451

713

UNITED STATES PATENT OFFICE

2,014,451

FASTENING DEVICE

William Pfeifer, Jr., Hackensack, N. J.

Application March 30, 1933, Serial No. 663,448

3 Claims. (Cl. 189—35)

The present invention relates generally to fastening devices and is more particularly directed to means for anchoring or securing corrugated or other metal sheeting to elements of a supporting frame, in various forms of construction work.

While my invention, as hereinafter will become manifest, possesses a wide range of utility in the erection of sheet metal structures of many types in different fields, for the purposes of this disclosure I have elected to describe it, more or less specifically, as it may be practiced in the assembly of sheets of corrugated metal upon rigid supporting members for the formation of a metal roof for a building or the like. It will be understood, however, that this is merely illustrative and is not to be construed, in any sense, as limiting my invention to this particular application.

As is well known, in constructing a building roof of corrugated metal sheeting, it is the standard practice to overlap the sheets inwardly of their edges and anchor the overlapped portions to the purlins or other supporting members of the roof framework. Numerous means for anchoring or fastening the sheets upon the framework have been proposed, none of which, however, has proven entirely satisfactory in meeting the demand for low production and installation costs combined with efficient performance of the intended function thereof. For example, in some instances, the fastening devices are of a special design and their use is consequently limited to certain kinds of work, while in others the devices are such as to measurably increase the labor outlay in the erection of a roof in which they are employed. In those forms of prior devices which are most generally utilized, a rivetting operation is necessary in securing the sheets to the purlins and in the performance of this operation it frequently happens that the ridges of the corrugations upon which the rivets are to be upset are indented to an appreciable degree, or the metal ruptured or broken about the rivet holes. This, obviously, not only endangers the security of the jointure of the sheeting with the purlins but makes it impossible to produce a watertight roof. The same is true, to a considerable extent, where bolts are utilized in the assembly of the anchoring devices, it being evident that, unless the amount of tension exerted upon the sheet metal in the application of the securing nut to the bolt is carefully controlled, with the concomitant increase in labor costs, the relatively thin material of the sheeting will be susceptible to damage.

From the foregoing, it will be evident that none of the devices now available for securing corrugated metal sheeting to rigid supporting members responds to the demand for low production and installation costs with efficiency in the performance of the work to which they are to be applied and, therefore, it is the general object of this invention to provide a means and method of fastening sheets of corrugated metal to their supporting elements which will meet this demand in a most simple and practical manner.

More specifically, it is the object of this invention to provide a device for fastening sheets of corrugated metal to cooperating supporting members whereby the erection of a structure in which they are employed will not only be expedited, but a secure and water-tight jointure of the sheets will be effected simultaneously with their connection to the supporting members.

It is a further object of my invention to provide a means for fastening corrugated sheets to relatively rigid supporting members, having the aforesaid characteristics and advantages, wherein the possibility of deformation or rupture of the ridges of the sheeting in the application of the fastening devices will be entirely eliminated, in a simple and practical manner, thus obviating the waste in labor and material which frequently results from the necessity of disassembling and discarding sheeting that may have been rendered non-serviceable by careless or inexpert performance of the jointure and anchoring operation.

Another object of my invention is to provide a means for anchoring metal sheeting to suitable supports, in different forms of construction work wherein the jointure between the sheets is rendered water-tight or leak-proof co-incidentally with the interlocking of the sheets and the supports, my means comprising an assembly of cooperating elements for simultaneously effecting a leak-proof jointure of the sheets and their positive connection to their supports in a single installation operation.

Other objects and advantages flowing from the practicing of my invention will become evident as the description proceeds and I would have it clearly understood that I reserve unto myself all rights to the full range of equivalents, both in structure and in use, to which I may be entitled under my invention in its broadest aspect.

A preferred embodiment of my invention which is particularly responsive to the requirements of roof construction is illustrated in the accompanying drawing, in which

Figure 1 is a view in elevation, partly in section, showing my fastening device as it functions in

anchoring corrugated metal sheets to a supporting member.

Figure 2 is a view in elevation, looking toward the web of the channel member, taken on the line 2—2 of Figure 1.

Figure 3 is a perspective of an element of the fastening device assembly, which functions as a support for the ridge of the sheeting, in the use of my invention.

Figure 4 is a view in perspective of the sheet-support engaging component of my device.

Figure 5 is also a view in perspective, showing fragments of overlapped sheets of corrugated metal interlocked with their supporting member by the use of my invention.

Figure 6 is a view similar to Figure 2, showing a slightly modified form of the invention.

Figure 7 is an elevation of the aperture sealing element of my assembly, and

Figure 8 is a perspective view of a modification of the ridge supporting element shown in Figure 3.

Referring now to the drawing, in detail, in which like characters of reference are employed to designate similar parts in the several views, and more particularly to the form of the invention illustrated in Figures 1 to 5, inclusive, 7 indicates a bracket or plate adapted for interlocking engagement with the sheet-supporting member of the roof or other construction, which, in the present showing, is a purlin of the conventional channel cross section, as shown at 8. This bracket, as will be observed, is of the so-called hook type, the body 7^a and co-operating nose 7^b, respectively, conforming to the contour of the outer and inner faces of the purlin flange with which it is associated as and for the purposes hereinafter described.

It will be noted that the aforesaid bracket is provided with a plurality of alined apertures 9, 10 and 11 through a pre-selected one of which the threaded end of the bolt 10, which may be of the screw-head type, is adapted to be passed to receive the securing nut 11, the assembled fastening device also including a preferably annular washer or gasket 12, preferably of lead or other soft metal or of any other material that will resist corrosion and cooperate with the bolt head in the functioning of my device in attaining the objectives to which the invention is directed.

In utilizing my fastening means, the corrugated sheets, 13 and 14, are overlapped upon the purlin 8, in accordance with the usual practice, the sheets being provided with a series of registering apertures alined along their mated edges, through which the bolts of the several fastening devices are adapted to be passed, so that the shanks thereof will parallel the web of the purlin, substantially as shown in Figure 1 of the drawing. The aforesaid openings for the reception of the bolts may be formed in the sheets prior to their location upon the purlins or after their edges have been overlapped, either by drilling or punching, or, if desired, the end of the shank of the bolt may be tapered so that the bolt may be driven therethrough to provide the necessary apertures in the mated sheets, it being obvious, of course, that a washer 12 is applied to each bolt before it is entered in the apertures of the sheets with which it is to cooperate.

In order that the sheeting along the ridges 13^a—14^a, in which the bolts are seated may not become distorted or the metal surrounding the bolt holes therein may not be broken or ruptured in the operation of anchoring the sheets to the purlins, I employ a shoulder or abutment 15 which is preferably formed from relatively flat stock in a U-shape, the lower edges of the arms being chamfered at their ends as at 16. The spacing of the arms of the U is slightly greater than the diameter of the bolts 10, so that, at an appropriate stage in the application of my fastening device, this shoulder or abutment may be inserted between the top flange of the purlin and the sheeting, with its upper edges in contact with the inner surface of the ridge of the under sheet, with which, of course, the complemental ridge of the outer sheet is in registration. As will be obvious, when the shoulder or abutment is in position, the bolt shank, adjacent the sheeting is straddled by the parallel arms thereof, the curved surface 15^a connecting the arms being preferably extended below the plane of the lower edges thereof, as at 15^b, to form a stop 15^c which will abut against the web of the purlin when the shoulder is in its proper functioning position, it being apparent that by the provision of this stop, the alinement of the shoulder or support 15 with the longitudinal axis of the ridge within which it is to be located in the placement of the shoulder is facilitated.

Following the location of the bolt within the sheeting apertures and the positioning of the abutment or shoulder 15, between the upper flange of the purlin and the sheeting, as just described, or at any other convenient stage in the sheet-anchoring operation, the lower end of the bolt shank is entered in the appropriate aperture of the bracket 7, depending upon the transverse measurements of the lower flange of the purlin, to position the bolt parallel to its web. The securing nut 11 is then applied to the bolt and turned up to draw the sheeting and the cooperating shoulder or abutment 15 into close association with the upper flange 8^a of the purlin, it being manifest, of course, that the bracket is engaged with the purlin flange as it is designed to function in the employment of my invention. The pressure exerted upon the washer or gasket 12 by the head of the bolt, as a result of the turning up of the nut upon the bolt, tends to compress and spread the metal of the washer or gasket so that it not only effectively seals the sheeting apertures through which the bolt shank passes but functions as a medium for interlocking the surfaces of the two relatively harder metals between which it is interposed, thereby materially increasing the efficiency of my anchoring device in resisting forces detrimental to the constant maintenance of the jointure, as vibration and the normal expansion and contraction of the metals, due to climatic or other conditions.

In the form of the invention illustrated in Figures 6 and 7, in lieu of the bolt 10 and the bracket 7, I employ a bolt 17, the end of the shank of which has a hook formation to embrace the lower flange of the purlin similarly to the bracket 7, the threaded portion of the bolt, in this embodiment of my invention, extending through the alined apertures of the overlapped sheets to receive a cap or acorn nut 18, in threaded engagement therewith, a washer or gasket of a softer material than the cap nut being interposed between the latter and the outer surface of the sheeting. This washer may be similar to that shown in Figures 1, 2 and 5 or it may be of a special design as illustrated in Figure 7, in which it will be noted that both faces in the zone of its central aperture are formed with substantially semi-spherical bosses 19 and 20, these bosses operating with the head of the bore of the cap nut

18 and the registered apertures of the sheets to provide a positive and water-tight jointure of the locking device and the sheets.

In Figure 8 there is illustrated a slightly modified form of abutment for interposition between a purlin and the ridges of the sheeting through which the fastening bolts are to be passed, from which it will be noted, the stop 18e is omitted and the ends of the arms 21 and 22 are of an approximately wedge-shape formation, as indicated at 21a and 22a.

While I have described my invention more or less specifically with relation to the preferred embodiment and modified forms thereof illustrated herein, it will be evident that the elements of my fastening device may vary in design, within certain limits, to meet various construction conditions, without departing from the spirit and scope of my invention, as defined by the appended claims; also that, as heretofore pointed out, the simplicity and ease of application of my fastening device; as well as the cooperation of the several elements thereof, enables me to attain the objectives to which my invention is directed, not only in the formation of a sheeting metal roof, but in all of those forms of construction work wherein it is desirable or necessary to anchor corrugated metal sheeting to a relatively rigid supporting frame in a manner which will assure a positive and water-tight jointure of the sheeting.

I claim:

1. A device for fastening corrugated metal sheeting to a channel member of a supporting framework, comprising a bolt, a bracket conformed to engage the inner and outer surfaces of the lower flange of said channel member and projecting beyond the web thereof, the projecting portion of said bracket being provided with a plurality of apertures, through a pre-selected one of which said bolt is adapted to extend, means in threaded engagement with the protruding end of said bolt and co-acting with said bracket to anchor said sheets to said support and a U-shaped fitting embodying a portion to abut upon the web of said member adapted to be inserted between said sheeting and said channel member and embracing said bolt, to support the sheeting for perforation for the reception of said bolt and to resist distortion of the sheeting in response to the functioning of the aforesaid anchoring means.

2. A device for supporting the hill section of a piece of corrugated metal sheeting from a flat surface of a structural element upon which the dale sections on either side thereof are superposed, for resisting distortion of the crest of said hill in its perforation for the reception of an anchoring bolt and in the functioning of the anchoring media, comprising a U-shaped member having its parallel sides provided with wedge shaped entering ends merging into flat top and bottom edges, adapted respectively to support the under part of the hill section of the sheeting and abut upon the flat supporting surface of said element, when said member is disposed within said hill, the base of said member connecting its aforesaid lower parallel sides being extended therebelow to form a shoulder, the face of which is adapted to abut against part of said structural element, disposed at a right angle to that with which said lower edges contact, whereby said shoulder will function as a stop and to center the longitudinal axis of said member on the longitudinal axis of said hill within which said member is located.

3. A means for fastening corrugated metal sheeting to a flanged member of a supporting framework, comprising a bolt, a bracket having one end conformed to engage the inner and outer faces of the flange of such member, the other end thereof extending beyond the web of said member and being provided with bolt-receiving apertures, a U-shaped fitting, embodying a portion formed to abut upon the web of said member, adapted to straddle said bolt with its parallel surfaces in bearing contact respectively with the flange of said member and the opposed sheeting, a seal for the bolt orifice in the sheeting formed of compressible material and having a raised central zone apertured to embrace said bolt in juxtaposition to its head, and means for threaded engagement with said bolt to coact with said bracket in anchoring said sheeting to said support, the raised central portion of said seal being deformable into close association with the underside of the bolt head, to provide an hermetic jointure between the sheeting and the anchoring device.

WILLIAM PFEIFER, Jr.

717

Jan. 10, 1950 W. T. GRAHAM 2,493,811

VIBRATING PLOW AND MOUNTING THEREFOR

Filed Feb. 26, 1947 3 Sheets-Sheet 1

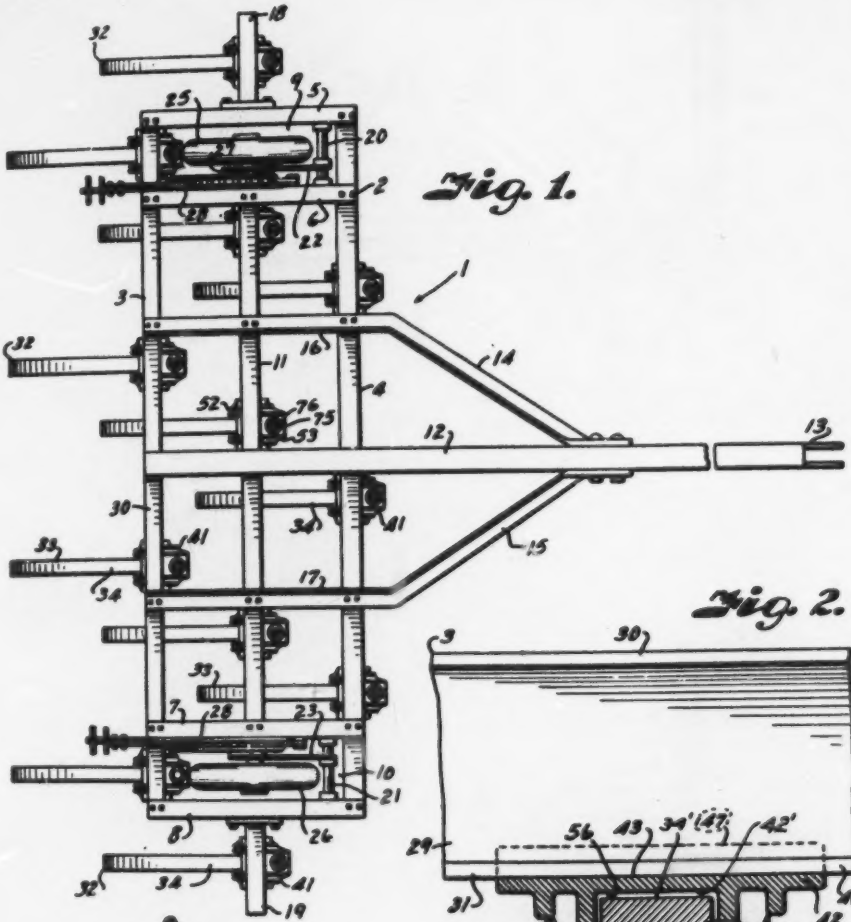


Fig. 1.

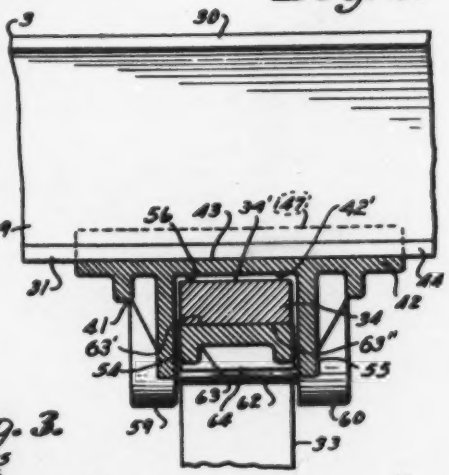


Fig. 2.

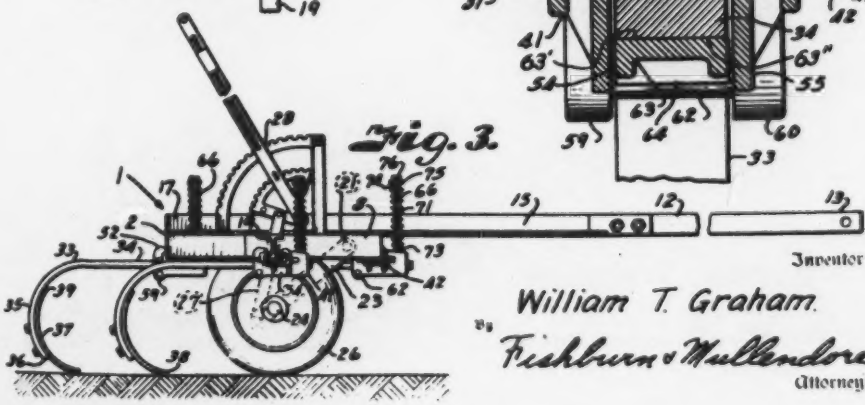


Fig. 3.

Inventor

William T. Graham.

By Fishburn & Mullendore

Attorneys

719

Jan. 10, 1950 W. T. GRAHAM 2,493,811

VIBRATING PLOW AND MOUNTING THEREFOR

Filed Feb. 26, 1947 3 Sheets-Sheet 2

Fig. 4.

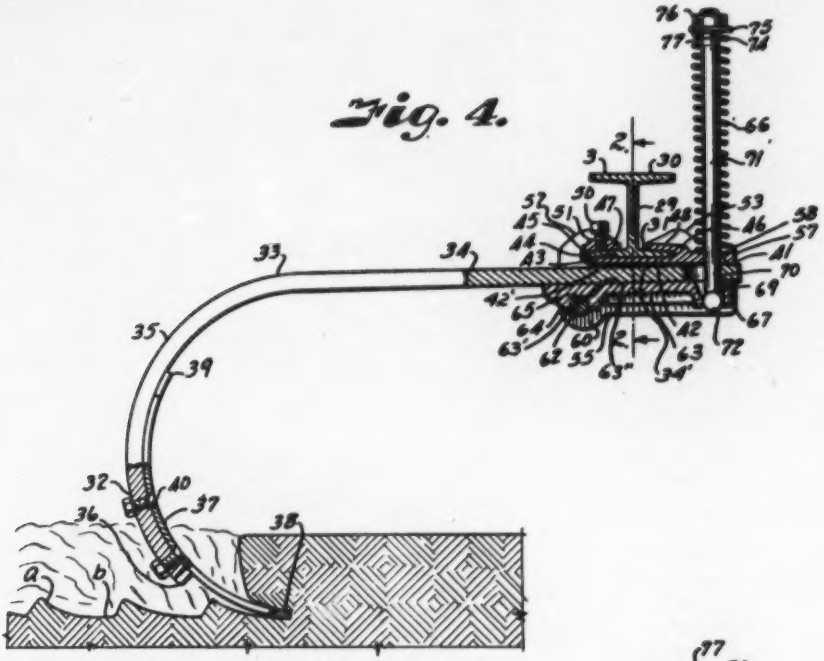
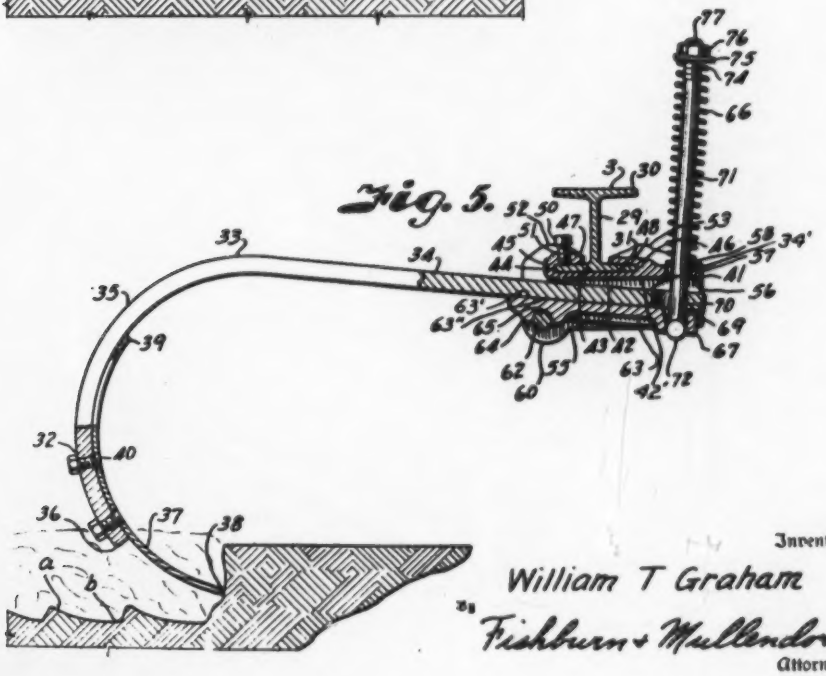


Fig. 5.



Inventor

William T Graham

By Fishburn & Mullendore.

Attorneys

721

Jan. 10, 1950 W. T. GRAHAM 2,493,811

VIBRATING PLOW AND MOUNTING THEREFOR

Filed Feb. 26, 1947 3 Sheets-Sheet 3

Fig. 6.

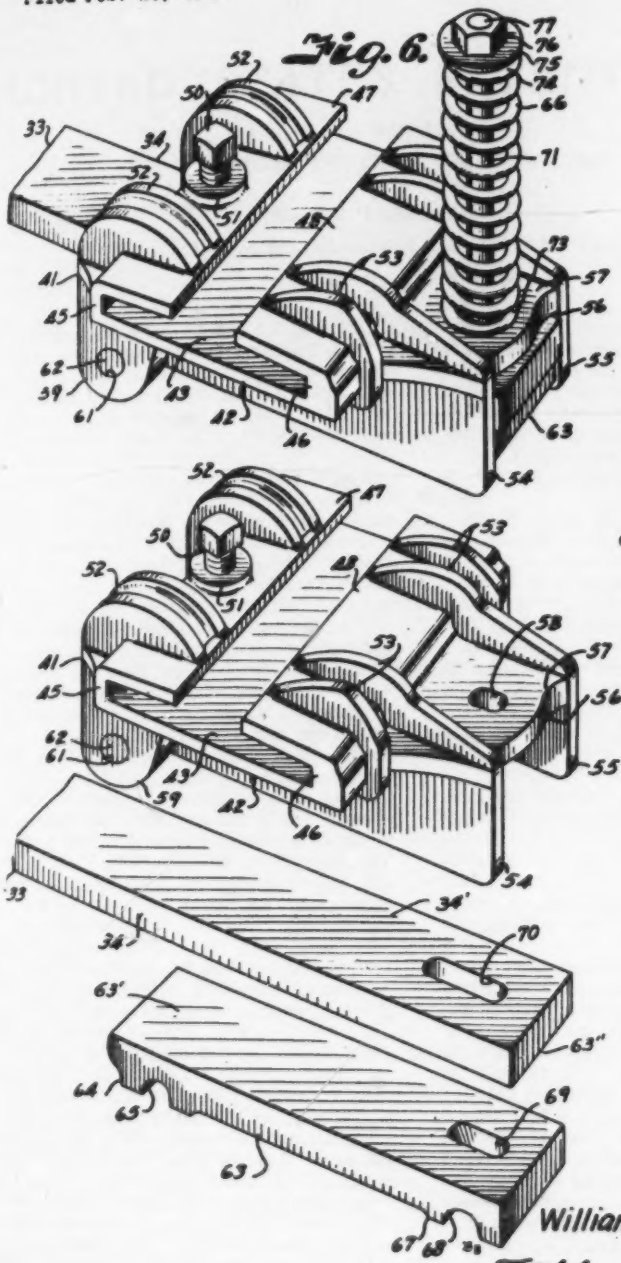


Fig. 7.

Inventor

William T. Graham.

Fishburn & Mullendore.

Attorneys

Patented Jan. 10, 1950

2,493,811

723

UNITED STATES PATENT OFFICE

2,493,811

VIBRATING PLOW AND MOUNTING THEREFOR

William T. Graham, Amarillo, Tex.

Application February 26, 1947, Serial No. 730,991

8 Claims. (Cl. 97—184)

1

This invention relates to plows of a type which includes a plurality of laterally arranged ground conditioning tools that work under the surface to heave and break the soil and form alternate ridges and furrows having exposed surfaces composed of clods, straw and other natural mulching material normally occurring on a field.

Plows of this character have proved most desirable because the ground prepared therewith is in condition for optimum moisture conservation and it is substantially free from erosion by water and wind. Also, the top soil does not dry out and form a hard crust since it is protected from the wind and sun by the mulching material with the result that better crop yields are obtained.

I have discovered that such plows can be made more effective by providing a pronounced pumping or vibratory action of the ground working tools. This action works the fine soils toward the bottom for forming the seed bed and the coarse materials to the top for forming a better mulch and moisture collecting surface. The pumping action also produces alternating pockets and ridges transversely of the bottoms of the furrows for collecting and storing small pools of moisture from which moisture is supplied to the loose soil of the seed bed by capillary action during dry periods. I have also determined that the pumping action of the tools results in an easier pulling plow and that less motive power is required.

Therefore, it is a principal object of the present invention to provide a plow of this character with tool mountings that result in maximum pumping action of the ground working tools.

Other objects of the invention are to provide a tool mounting that includes a sliding support on a fulcrum member for attaching the tools pivotally on the plow frame; to provide resilient means acting on one side of the fulcrum for retaining the tools in the ground and for producing the resiliency that results in pumping action of the tools; to provide means for selectively varying the pumping action in accordance with the hardness of the ground being worked; to provide a mounting for the ground working tools that reduces breaking and bending of the plow parts when operating in hard and rocky soils; to provide a resilient tool mounting that cooperates with the inherent resiliency of the shank of the ground working devices which results in a chiseling or gouging action of the ground working tools for forming the ridges and pockets in the bottoms of the furrows; and to provide a plow structure and tool mounting that is simple and reliable in operation.

In accomplishing these and other objects of the invention I have provided improved structure,

2

the preferred form of which is illustrated in the accompanying drawing wherein;

Fig. 1 is a plan view of a plow constructed in accordance with the present invention.

Fig. 2 is an enlarged section through one of the tool mountings on the line 2—2 of Fig. 4.

Fig. 3 is a side elevational view of the plow showing the ground working tools in raised position.

Fig. 4 is an enlarged section through one of the ground working tools and its mounting and showing the tool in ground working position.

Fig. 5 is a similar view showing action of the tool to produce the chisel cuts or gouges in the bottom of the furrows.

Fig. 6 is a perspective view of one of the tool mounting units removed from the carrying frame and showing the end portion of the tool shank.

Fig. 7 is a perspective view of the parts of the unit arranged in spaced relative positions.

Referring more in detail to the drawings:

1 designates a plow constructed in accordance with the present invention and which includes a frame 2 composed of transverse beams 3 and 4 spaced apart at the ends thereof by pairs of longitudinal members 5—6 and 7—8 and which provide wheel pockets 9 and 10. The frame also includes an intermediate transverse beam 11 connecting the innermost longitudinal members 6 and 7.

Extending across the mid portions of the beams and suitably connected thereto is a tongue 12 having its forward end 13 arranged for connection to the draftbar of a tractor (not shown). The tongue 12 is suitably braced relative to the frame by bars 14 and 15 having rear ends 16 and 17 extending parallel with the longitudinal members 6 and 7 of the frame and which are secured to the transverse beams 3, 4 and 11. Extending from the end members 5 and 8 in aligning registry with the intermediate beam 11 are beam extensions 18 and 19.

Mounted at the forward end of the wheel pockets 9 and 10 and carried between the pairs of longitudinal members 5 and 6 and 7 and 8 are shafts 20 and 21 carrying arms 22 and 23 having wheel spindles 24 on their lower ends for journalling ground wheels 25 and 26.

The frame 2 is adapted to be raised and lowered with respect to the wheels 25 and 26 by connecting the free ends of the arms 22 and 23, through links 27, with lever mechanisms 28 whereby the ground working devices hereinafter described may be moved into and out of ground working position.

The ground working devices are carried by the

transverse beams 3, 4 and 11 at spaced intervals along the lengths thereof and in staggered relation to form a plurality of spaced furrows when the plow is in use. The transverse beams of the plow frame are preferably of H-shaped cross section and arranged with the webs 29 in vertical position with the upper and lower flanges 30 and 31 extending horizontally.

The ground working devices 32 each include a shank or stem 33 of substantially rectangular cross section and of a width and thickness to provide a certain amount of resiliency. The stem or shank includes a substantially straight portion 34 adapted to extend in the direction of travel of the machine and a rearwardly and downwardly curved portion 35 which terminates in a forwardly curving end 36 for mounting ground working tools or blades 37. The tools 37 are correspondingly curved to seat within the curvature of the shanks and have sharpened ends 38 and 39 so that they may be reversed. The ground working tools are secured to the shanks by fastening devices such as plow bolts 40. The ground working tools when mounted are firmly supported within the curvature of the shanks and one of the pointed ends extends forwardly in position to work underground and cause the soil to heave and break and form a furrow.

In order to accomplish the objects of the present invention the ground working devices 32 are carried upon the beams by novel mountings arranged to give the tools the above described vibratory or pumping action. The mountings are of identical construction and each includes a bracket including a clamp member or part 41 having a plate portion 42 provided with a flat face 43 corresponding to the width of the lower flange 31 of the beams 3, 4 and 11 and which is adapted to closely engage therewith. Projecting laterally from the front and rear sides of the plate portion 42 and extending across the edges 44 of the lower flanges 31 are web portions 45 and 46 carrying inwardly extending flanges 47 and 48 that engage over the upper faces of the lower beam flanges 31.

The length of the plate portion 42 is such as to provide an ample contact area with the flanges 31 so as to assure a firm connection when the clamp is fastened to its beam by a set screw 50. The set screw 50 is threaded through a boss 51 formed on the upper face of the flange 47 so that the end thereof bears against the upper face of the flange to draw the plate portion 42 of the clamp tightly against the bottom face of the beam. The ends of the clamp member 41 are adequately ribbed as at 52 and 53 for reinforcing the beam contacting portions thereof.

Depending from the underside of each clamp member 41 are flanges 54 and 55 that are spaced apart to provide an open bottom channel or way 56 in which the end portions of the shanks of the ground working devices are anchored and adapted to pivot. The flanges 54 and 55 extend forwardly of the plate portion of the clamp member 41 on the respective sides of a forward extension 57 of the plate portion 42. The extension 57 has an elongated opening 58 extending substantially vertically therethrough with the longer axis arranged parallel with the flanges 54 and 55. Formed on the flanges 54 and 55 at the opposite ends thereof are depending ears 59 and 60 having transverse openings 61 in which are mounted the ends of a fulcrum or pivot pin 62 that extends across the way or channel 56, the pin 62 being carried in spaced relation with the plate portion 42 to accommodate therebetween the end portion of the shank 33 of a ground working device and a fulcrum plate or clamp part 63. The under side of the plate portion 42 between the flanges 54 and 55 forms a clamping portion or face 42' conforming with the upper face 34' of the end portion of the shank.

The fulcrum plate 63 having a clamping portion or face 63' is retained in contact with the lower face 63'' of the forward end portion of the tool supporting shank and has a transverse rib 64 formed on the underside that is provided with a groove 65 opening downwardly to accommodate the pivot or fulcrum pin 62 and on which the fulcrum plate 63 together with the overlying end portion of the shank 33 are adapted to pivot or hinge under action of a spring 66 as now to be described.

The opposite end of the fulcrum plate has a similar rib 67 provided with a transverse groove 68 intersecting an elongated opening 69 that registers with the opening 58 previously described and with an elongated opening 70 provided in the forward end of the shank 33. Extending through the openings is a T-bolt or rod member 71 having a T-shaped head 72 adapted to rock within the groove 68. The rod 71 extends upwardly through the slot-like openings 69, 70 and 58 and projects a substantial distance above the bracket extension 57 on which an end 73 of the spring 66 seats. The other end 74 of the spring engages a spring seat or washer 75 that is sleeved on the upper end of the rod and retained against the upper end of the spring by an adjusting nut 76 mounted on a threaded end 77 of the rod as best shown in Figs. 6 and 7. The spring 66 is thus retained in compression to keep the head 72 in rocking engagement with groove 68 of the gripping portion or face 63' of the fulcrum plate 63 and the fulcrum plate in contact with the lower face 63'' of the end portion of the shank 33 and the upper face 34' of the end portion of the shank 33 against the clamping portion 42' (as shown in Fig. 4). The ground working tools are thus resiliently supported between the clamping members or parts and are adapted to rock thereon as permitted by action of the springs to effect pumping action of the ground working tools incidental to drag of the tools through the ground and resiliency of the compression springs so as to produce the furrows and chisel cuts indicated at "a" and forming the pockets indicated "b" in Figs. 4 and 5 of the drawings.

In assembling the ground working devices 32 on the transverse beams 3, 4 and 11 of the plow frame 2, the clamp brackets 41 are slid onto the beams from the ends thereof when the frame 2 is being assembled. The brackets are spaced on their respective beams and in relation to the brackets of the other beams so as to equalize the draft on the respective sides of the tongue 12 and provide the desired spacing of the furrows. When the brackets 41 are in position they are rigidly anchored to the lower flanges 31 of the beams by tightening the set screws 50 which pull the brackets up against the bottom of the beam flanges. This clamping action of the brackets and contact of the brackets with the beam flanges rigidly anchor the brackets in position against forces applied thereto by the ground working devices 32 so that the ground working devices are retained in their fixed working positions.

In attaching the ground working devices the

fulcrum plates 63 are inserted between the flanges 54 and 56 of the brackets and the rear ends are moved onto the fulcrum pins 62. The forward ends of the shanks 33 of the ground working devices are then projected through the space or channel between the plate portions 43 of the brackets 42 and the fulcrum plates 63 so that the slotted openings 76 in the forward ends register with the openings 58 and 59. The rods or T-bolts 71 are then applied by projecting the shanks upwardly through the registering openings 59, 76 and 58 until the T-shaped heads 72 thereof seat within the grooves 68. The springs 66 are then sleeved over the upper ends of the rods 71 so that the lower ends 73 seat against the extensions 57 of the brackets 41. The spring seats 75 and nuts 78 are then applied to the threaded ends 77 of the rods and the nuts tightened to compress the springs in a sufficient amount to retain resiliently the ground working devices in ground working position, the degree of compression of the springs being regulated in accordance with the hardness of the ground to be plowed.

In using a plow equipped with ground working devices as above described, the tongue 12 of the plow is attached to the drafthar of a tractor to be drawn thereby over the field to be plowed. When the plow is in position to start the furrows, the lever mechanisms 28 are actuated to lower the plow frame 2 with respect to the wheels 26 and 26 which brings the ground working tools 39 into contact with the soil and forward pull on the plow forces the ground working tools 39 into the ground to a depth as set by the lever mechanisms 28. Pull on the plow frame in one direction and resistance to the pull offered by the ground working tools in the opposite direction causes the shanks 33 to slide on the fulcrum-plates 63 until the forward ends of the slotted openings 76 of the shanks move into stop engagement with the rods 71 to limit movement of the shanks relatively to the clamping portion of the members 53.

The fulcrum plates 63 are retained from shifting therewith by the pivot pins 62. Consequently, the relative positions of the heads 72 of the rods 71 are fixed but they rock within the grooves 68 of the fulcrum plates 63 until the rods 71 strike the rear ends of the elongated openings 58 of the mounting brackets 41. The springs normally urge the forward ends of the shanks 33 in contact with the bottom surfaces or clamping portions of the plate portions 43 of the brackets 41 and the fulcrum plates 63 with the gripping portions thereof against the under faces of the shanks to provide frictional resistance that cooperates with the springs 66 in anchoring the ground working devices to the plow frame.

As the plow moves forward the pointed ends 38 of the tools 37 work into the ground until the resistance is such as to cause rocking movement of the tool shanks 33 on the fulcrum pins 62 of the mounting brackets, with the forward ends moving the pivoted clamping members of the clamps away from the fixed or bracket members against action of the springs 66. During this action there is a slight longitudinal movement of the shanks on the fulcrum plates. When the soil breaks over the ground working tool, the spring is again effective to exert a lifting thrust on the forward ends of the shanks 33 which causes the tool carrying ends of the shanks to rock downwardly and produce downward and forward cut (a) in the soil until the resistance

is again sufficient to cause the upward movement against action of the spring 66, which movements produce a constant rocking or pumping action of the tools to form a continuous series of pockets (b) in which moisture is adapted to collect. As the tool passes the broken and upheaved soil falls to the side and settles back into the furrow to cover the pockets, however shallow furrows are left between upstanding ridges without turning over of the soil. The pumping action of the tools also works the fine soil downwardly to form the seed bed and the larger clods, straw and other natural mulching material are worked to the surface for covering the fine soil and for serving as a mulch to preserve the moisture which collects in the furrow and in the bottom pockets thereof. As the ground dries after a rain, the moisture collecting in the pockets moves upwardly by capillary action to supply the seed bed while the clods and other mulching material preserves the moisture and prevents crusting over of the soil. Also, since the pockets "b" trap the water, the water has sufficient time to penetrate into the ground instead of running off. The furrows trap the rainfall and prevent washing and soil erosion. The roughage and mulching material left on the ground also protects the soil from wind erosion.

From the foregoing it is obvious that I have provided a plow structure wherein the pumping action of the ground working tools enhance the desirable features of the plow and that the pumping and constant movement of the ground working tools produces an easier draft. It is also obvious that my improved mounting reduces or eliminates breakage of the ground working devices since they yield automatically under action of the springs when they strike immovable objects such as rocks or other obstructions.

What I claim and desire to secure by Letters Patent is:

1. In a plow having a frame and a ground working device provided with a shank adapted to be attached to said frame, means for attaching the shank to the frame which results in a pumping action of the ground working device when the plow is in use, including a bracket on the frame having a downwardly opening way extending in the fore and aft direction of the plow, a pin extending transversely across said way, a fulcrum plate pivotally mounted on the pin at one end and having its other end extending along said shank on the side of the pin opposite the ground working device, a rod having pivotal connection with the fulcrum member and extending through an elongated opening in said shank and through a registering opening of the bracket to anchor the shank to said bracket and provide sufficient longitudinal relative movement between the shank and fulcrum member to accommodate oscillation of the shank, and a spring having one end engaged with said rod and the other end engaged with the bracket for yieldingly permitting rocking movement of the fulcrum member for effecting said pumping action of the ground working device.

2. In a plow having a frame and a ground working device provided with a shank adapted to be attached to said frame, means for attaching the shank to the frame which results in a pumping action of the ground working device in the frame when the plow is in use, including a bracket on the frame having a downwardly opening way extending in the fore and aft direction of the plow, a pin extending transversely of said way, a ful-

crum plate pivotally mounted on the pin at one end and having its other end extending along said shank on the side of the pin opposite the ground working device, a rod having pivotal connection with the fulcrum member and extending through an elongated opening in said shank and through a registering opening of the bracket to anchor the shank to said bracket and provide sufficient longitudinal relative movement between the shank and fulcrum member to accommodate oscillation of the shank on the bracket, a spring sleeved on said rod and having one end seated on the bracket, and means on the rod engaging the other end of the spring to retain the fulcrum member in contact with said end of the shank and said end of the shank in contact with the bracket, said spring being yieldable to effect said pumping action of the ground working device.

3. In an apparatus of the character described, a plow frame including a transverse beam having a flange on its lower edge, a tool supporting shank extending across said lower flange, a bracket, means attaching the bracket to said flange, a fulcrum on the bracket, a fulcrum plate pivoted on the fulcrum and having a transverse groove intersected by an opening through said fulcrum plate and registering with elongated openings in the shank and bracket, a rod extending through said openings and having a T-shaped head engaged in said groove, a spring on the rod having one end bearing on the bracket, a washer on the rod engaging the other end of the spring, and a nut threaded on the rod and engaging the washer to compress said spring and retain the fulcrum plate in contact with the shank and the shank in contact with the bracket.

4. In an apparatus of the character described, a plow frame including a transverse beam having a flange on its lower edge, a bracket fixed to said flange and having depending laterally spaced flanges, a tool supporting shank extending forwardly between said flanges, a pin extending transversely between the flanges of the bracket at a point below the shank, a fulcrum plate pivoted on said pin and extending forwardly in supporting engagement with the shank, a rod pivotally connected with the fulcrum plate and extending through registering openings in said shank and bracket to anchor the shank for limited longitudinal movement on the fulcrum plate, a spring on the rod having one end bearing against the bracket, a washer on the rod engaging the other end of the spring, and a nut threaded on the rod and engaging the washer to compress said spring for retaining the tool in the ground and yielding in response to resistance on said tool when the plow is in operation to produce a pumping action of the tool in the soil.

5. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and supporting the shank of the ground working tool from the frame including a clamp fixedly attached to the frame, the clamp including a part that is fixed to the frame and another part pivotally mounted on the fixed part, the shank having an end portion thereof between said parts and in movable engagement with the said parts, a coil spring having one end thereof in engagement with one of said parts, means at the other end of the spring connected with the other of said parts to maintain the spring in position and for holding the said parts of the clamp with the end portion of the shank therebetween in their resiliently held-together association so that when the shank is rocked or moved the end portion of the shank between the parts will cause the movable part of the clamp to move away from the fixed part along with said end portion and back to normal position with the end portion of the shank contactingly held between the two parts, and means on one of the parts engageable with a part of the end portion of the shank to prevent disengagement of the shank from the clamp but to allow same to rock.

6. In a device as claimed in and by claim 5, wherein the fixed part of the clamp is of channel shape formation and the said end portion of the shank is disposed therein and prevented from moving laterally.

7. In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction, a mounting for attaching and bodily supporting the shank from the frame to carry the ground working tool including a pair of shank clamping members having clamping portions conforming with upper and lower faces of the shank, means on one of the clamping members for rigidly fixing said clamping member to the frame with the clamping portion thereof extending in the direction of movement of the plow, a fulcrum hingedly connecting the other clamping member to the fixed clamping member at one end of the clamping portions with the shank therebetween and with the clamping portions normally in contact with the corresponding faces of the shank substantially along the length of the clamping portions, a rod member having a portion at one end in connecting engagement with one of the clamping members, a spring seat on the other end of the rod member and a spring having one end engaging the spring seat and the other end seating upon the other of the clamping members to cooperate with the fulcrum in normally retaining the clamping members with the clamping portions thereof in substantially complete contact with the corresponding faces of the shank and yieldable under rocking action of the shank to maintain the clamping portion of the hinged clamping member in contact with the shank as the shank rocks away from the clamping portion of the fixed clamping member, said shank having a part thereof in stop engagement with one of said members to limit movement of the shank relatively to the clamping portion of the hinged clamping member when the shank is under rocking movement.

8. In a device as claimed in and by claim 7 wherein the rigidly fixed clamping member is of channel shape formation and the shank is disposed therein and prevented from moving laterally.

WILLIAM T. GRAHAM.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
407,273	Allstatter	July 16, 1889
2,125,512	Martins	Aug. 2, 1938

FOREIGN PATENTS

Number	Country	Date
226,500	Great Britain	June 11, 1926

Kl. 45 a - 51

727

DANMARK

PATENT Nr. 57391.

BESKRIVELSE

MED TILHØRENDE TEGNING

OFFENTLIGGJORT DEN 18. MARTS 1940

AF

DIREKTORATET FOR PATENT- OG VAREMÆRKEVÆSENET.

Maskinfabrikant PETER VAGN PETERSEN,

UGGERLØSE BY OG SOGN, HOLBÆK AMT.

Fjedrende Spændestykke til Radrensere.

Patent udstedt den 4. Marts 1940. Patenttiden løber fra den 2. Januar 1939.

Den foreliggende Opfindelse angaar et til en Radrensers Ramme fastspændt, fjedrende Spændestykke indrettet til Optagelse af de i Handelen gængse udelte Radrensertænder. Der kendes allerede Spændestykker af denne Art, der imidlertid lider af den Mangel, at Tænderne ikke er tilstrækkelig stabile over for Sidepaavirkninger. Denne Mangel er ifølge Opfindelsen afhjulpet ved, at den Tanden optagende og foroven af en i og for sig kendt indstillelig Skruefjeder paavirkede Del ikke alene med Sidevanger omslutter Tanden paa en betydelig Længde, saa at Tanden ikke kan rokke i sit Leje, men ogsaa selv paa en betydelig Strækning er styret af Sidevanger paa den til Maskinrammen fastspændte Del af Spændestykket og derfor ikke kan komme til at rokke til Siden i denne Del, under sit Drejning om en gennem de sidstnævnte Vanger ført Omdrejningsbolt.

En Udførelsesform for Opfindelsen er vist paa Tegningen, der viser det paagældende Spændestykke set fra Siden delvis i Snit.

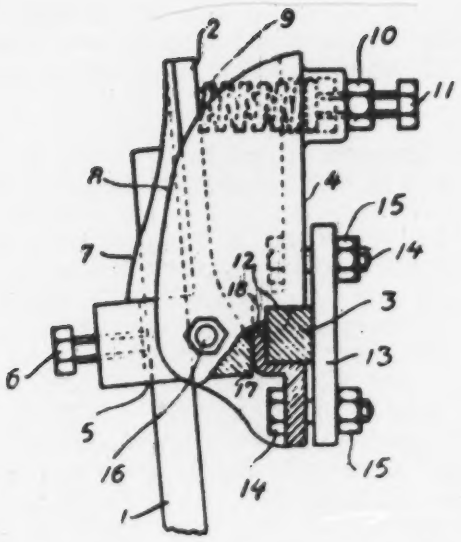
Spændestykket bestaar af en til Optagelse af en udelt, med et ikke vist Skær forsynet Radrensertand *1* bestemt Del *2* og en til Fastspænding paa Maskinrammen *3* bestemt Del *4*. Delen *2* har et firkantet Hul *5* til Optagelse af den i Højden ved Hjælp af en Skruebolt *6* indstillelige Tand *1*, og denne er desuden styret over en længere Strækning af to fra Delen *2* bagudvendende Sidevanger *7*. Delen *4* har ligeledes to bagudvendende Sidevanger *8*, der paa en betydelig Strækning omfatter og styrer Delen *2*, som foroven paa kendt Maade er under Paavirkning af en kraftig Skruefjeder *9*, hvis Spænding kan reguleres ved Hjælp af en med Kontramøtrik *10* forsynet Skruebolt *11*. Delen *4* har i sin Forvæg og i sine Sidevanger *8* en Udskæring *12*, der omslutter Maskinrammen *3*, og den fastspændes til denne ved Hjælp af en Spændeplade *13* og Skruebolte *14* med Skruemøtrikker *15*.

Delen *2*, der er drejelig om en gennem Sidevangerne *8* ført Omdrejningsbolt *16*, har fortil et Næb *17*, der ved at tage paa den bag om Maskinrammen *3* førte Del *18* af Forvæggen standser Bevægelsen af Delen *2*, naar denne sidste trykkes bagud af Fjederen *9*.

Patentkrav.

Fjedrende Spændestykke til Radrensere indrettet til Optagelse af de i Handelen gængse

udelte Radrensertænder, kendetegnet ved, at den Tanden optagende og foroven af en i og for sig kendt indstillelig Skruefjeder 9 paavirkede Del 2 ikke alene med Sidevanger 7 omslutter Tanden paa en betydelig Længde, saa at Tanden ikke kan rokke i sit Læje, men ogsaa selv paa en betydelig Strækning er styret af Sidevanger 8 paa den til Maskinrammen fastspændte Del 4 af Spændestykket og derfor ikke kan komme til at rokke til Siden i denne Del under sin Drejning om en gennem Vangerne 8 ført Omdrejningsbolt 16.



København 1948 A/S · [illegible]

PETERSEN 733
Patent No. 57,391

Translation of Danish Patent No. 57391, Class 45 a-51, to Peter Vagn Petersen; patent issued March 4, 1940; period of patent extends from January 2, 1939; published March 18, 1940. Resilient mounting piece for horseshoes.

The present invention concerns a resilient mounting piece, fixed to the frame of a horseshoe and arranged to receive the undivided hoe teeth current in the trade. Mounting pieces of this kind are already known, but suffer from the defect that the teeth are not sufficiently resistant to lateral stresses. This defect is remedied according to the invention by the fact that the part receiving the tooth and influenced above by an adjustable coil spring of known type not only encloses the tooth for a considerable length with lateral cheeks, so that the tooth cannot rock in its bearing, but is itself also guided over a considerable extent by lateral cheeks on the part of the mounting piece fixed to the machine frame and cannot therefore rock to the side in this part during its rotation on a bolt passed through the last-mentioned cheeks.

An embodiment of the invention is shown on the drawing, which shows the mounting piece concerned seen from the side, partly in section.

The mounting piece consists of a part 2, intended to receive an undivided tooth 1 of a horseshoe, provided with a share not shown, and a part 4, intended to be fixed to the machine frame 3. The part 2 has a quadrangular hole 5 to receive the tooth 1, adjustable in height by means of the screw bolt 6, and is, furthermore, guided over a considerable distance by two lateral cheeks 7 facing away from the part 2. The part 4 likewise has two backward-facing lateral cheeks 8, which over a considerable distance embrace and guide the part 2, which is under the influence above in known manner of a strong coil spring 9, whose tension can be regulated by means of a screw bolt 11, provided with a counternut 10. The part 4 has in its front wall and its lateral cheeks 8 a hollow space 12, which encloses the machine frame 3, and it is fixed thereto by means of a clamp plate 13, and screw bolts 14 and nuts 15.

The part 2, which rotates on a bolt 16 passed through the lateral cheeks 8, has a beak 17 at the front, which by engaging on the part 18 of the front wall carried back of the machine frame 3 stops the movement of the part 2, when the latter is pressed back by the spring 9.

Patent Claim

Resilient mounting piece for horseshoes, arranged to receive the undivided hoe teeth current in the trade, characterized thereby, that the part 2 receiving the tooth and influenced above by an adjustable coil spring of known type 9 not only encloses the tooth for a considerable length with lateral cheeks 7, so that the tooth cannot rock in its bearing, but is itself also guided over a considerable extent by lateral cheeks 8 on the part 4 of the mounting piece fixed to the machine frame and cannot therefore rock to the side in this part during its rotation on a bolt 16 passed through the cheeks 8.

735

111,910

Application Date : 12th Jan., 1940. No. 127/40.

Department of Patents
Patents Act 1903-1921
Commonwealth of
Australia.

Applicant (Actual Inventor) .. .. ERNEST ALBERT TRAEGER.
Application and Provisional Specification Accepted, 13th February, 1940.
Complete Specification after Provisional Specification Lodged, 18th September, 1940.
Complete Specification .. .. .. Accepted, 8th November, 1940.
Acceptance Advertised (Sec. 50) .. 21st November, 1940.

Classes 39.3; 39.9.

Drawing attached.

LIBRARY
FEB 13 1941
U. S. PATENT OFFICE

COMPLETE SPECIFICATION.

"An improved spring tyne for agricultural implements."

I, ERNEST ALBERT TRAEGER, of 116 King William Road, Hyde Park, State of South Australia, Commonwealth of Australia, Salesman, British Subject, hereby declare this invention, and the manner in which it is to be performed, to be fully described and ascertained in and by the following statement:

This invention relates to an improved spring tyne for agricultural implements, and in particular it relates to spring tynes of the "S" type which are commonly used in drills and combines.

The tyne constructed as heretofore usually comprises a main S-shaped member of spring steel the upper end of which is secured to the frame or float of the implement and the lower end of which is adapted to take a share or other tilling tool and, in the case of a drill or combine, to also support the boot into which the seed and or fertilizer is fed.

The upper part of the tyne is usually reinforced by an internal, and sometimes also by an external, spring steel member of complementary shape to the upper part of the tyne, which member strengthens the tyne at such part and is commonly known as a "helper".

In tynes so constructed however a weakness appears to exist at or about the centre of the tyne, for whenever a tyne breaks such breakage usually occurs at this point.

It is the object of my invention to provide a tyne which is so constructed that breakage is minimised or eliminated, beside having other advantages.

According to my invention the tyne is constructed of general form as heretofore but, instead of being made with a continuous main member, the main member is made in two overlapping parts joined together by means of a hinge which will allow the rear part to swing upwardly against the influence of a spring, or springs, arranged between the two parts and which spring normally holds the rear part in working position, the downward movement of the rear part beyond working position being prevented by contact with the forward part.

In order that the construction of my invention and the manner of its operation

7066. 5 12 40.—140.—Price, 1s. 6d. post free.

737

111,910

may be the more clearly understood I will now describe the preferred form of same with reference to the accompanying drawings in which:—

Fig. 1 is a side view.

Fig. 2 is a cross section on line 2—2 of Fig. 1, and

Fig. 3 is a central longitudinal section, showing also in dotted lines the rear part in a raised position relatively to the front part.

In the drawings the main member is shown as comprising two parts 1 and 2 joined together by a hinge pin 3 which allows the rear part 2 to swing upwardly when it strikes a serious obstruction.

In order to carry this hinge pin 3 the rear end of the forward part 1 is turned over to form an eye 4, and the rear part 2 has secured to it by a rivet 6, or by welding or other means, a U-shaped bracket or clip 5 with perforations in its upwardly extending members, the hinge pin 3 passing through the eye 4 of the forward part and through the perforations in the upwardly extending members of the clip 5 of the rear part.

Normally the rear part 2 is held in working position relatively to the forward part 1 by means of a spring device and a stop.

The stop is formed by the forwardly extended end 8 of the rear part 2 which extends forward past the hinge pin 3 and contacts with the underside of the forward part 1 of the tyne and prevents further upward movement of same, but permits upward movement of the rear part of the tyne.

The spring device comprises two springs 10 in compression which encircle two rods 11, preferably curved as shown. These rods have in their lower ends eyes which fit upon a pin or bolt 12, which passes through an eye at the front end of the extension 8, and pass thence through perforations in a cross plate 13 secured upon the top face of the helper 15 (or it may be secured upon the top face of the main member 1 if the helper is shortened) and have upon their upper ends nuts 16 and cone shaped washers 17 which engage the upper ends of the springs 10 the lower ends of which rest upon the cross plate 13. The metal around the perforations in the cross plate 13 is pressed upward to form shallow cone-shaped projections. The purpose of the cone-shaped washers 17 and the cone-shaped projections upon the cross plate 13 is to centre the ends of the springs 10 about the rods 11. The nuts 16 upon the rods permit the pressure of the springs to be adjusted as desired.

It will be appreciated that although I have described in detail one embodiment of my invention, other embodiments may be readily devised.

A tyne constructed according to my invention will operate similarly to the tynes previously constructed, that is to say the tyne may act as an ordinary spring tyne, flexing along the upper curved portion of the "S" and also along the lower curved portion heretofore. When however a stone or other obstruction is encountered requiring an unusual amount of movement the main flexing need not be taken by the upper or the lower curved portions of the "S" but can be taken by the upward swinging of the lower part 2 of the tyne about the pivot 3 with consequent compression of the springs 10. So soon as the obstruction has been passed the springs cause the two parts of the tyne to return to normal relative position.

Having now fully described and ascertained my said invention and the manner in which it is to be performed I declare that what I claim is:—

1. A spring tyne for agricultural implements comprising two parts hinged together to permit the rear part to swing upwardly relatively to the forward part and provided with a spring to normally hold the two parts in fixed relationship one to the other.

2. A spring tyne for agricultural implements having its main member made in two parts joined together by means of a hinge which will allow the rear part to swing upwardly against the influence of a spring, or springs, carried by the forward part and which spring normally holds the rear part in working position, the downward movement of the rear part beyond working position being prevented by contact with the forward part.

3. A spring tyne for agricultural implements having its main member made in two overlapping parts joined together by means of a hinge which will allow the rear part to swing upwardly against the influence of a spring, or springs, carried by the forward part and which spring normally holds the

739
111,910

rear part in working position, the downward movement of the rear part beyond working position being prevented by contact of the forward end of the rear part with the underside of the rear end of the forward part.

4. A spring tyne as claimed in either of the preceding claims characterised in that the front end of the rear part of the tyne projects forwardly beyond the hinge and contacts with the underside of the forward part and has hingedly attached to it the lower ends of two rods which pass upwardly through two perforations in a cross plate secured upon the forward part of the tyne and have upon their upper ends nuts or other stop devices which engage the upper ends of two springs which encircle the two rods and are confined between the said nuts and the said cross plate.

5. The improved spring tyne for agricultural implements constructed and operating substantially as described and illustrated.

Dated this 16th day of September, 1940.

ERNEST ALBERT TRAGGER.

By his Patent Attorneys,

COLLISON & Co.

Fellows Institute of Patent Attorneys of Australia.

Witness A. R. Donnell.

5 6

Printed and Published for the DEPARTMENT OF EXTERNAL COMMONWEALTH OF AUSTRALIA, by L. F. JOHNSTON, Commonwealth Government Printer, Canberra.

741

111,910

FIG. 1

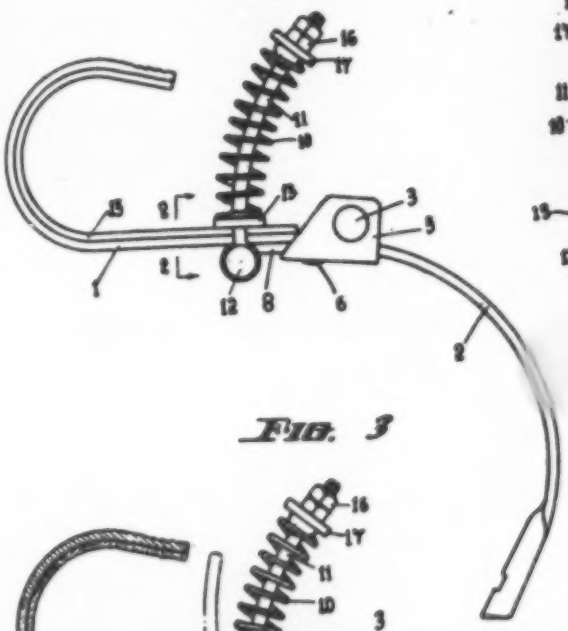


FIG. 2

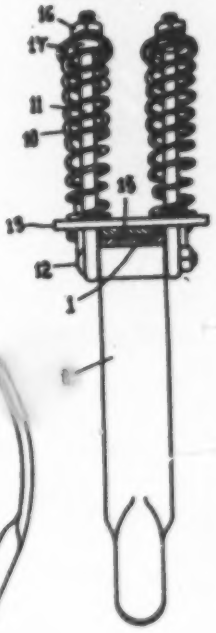
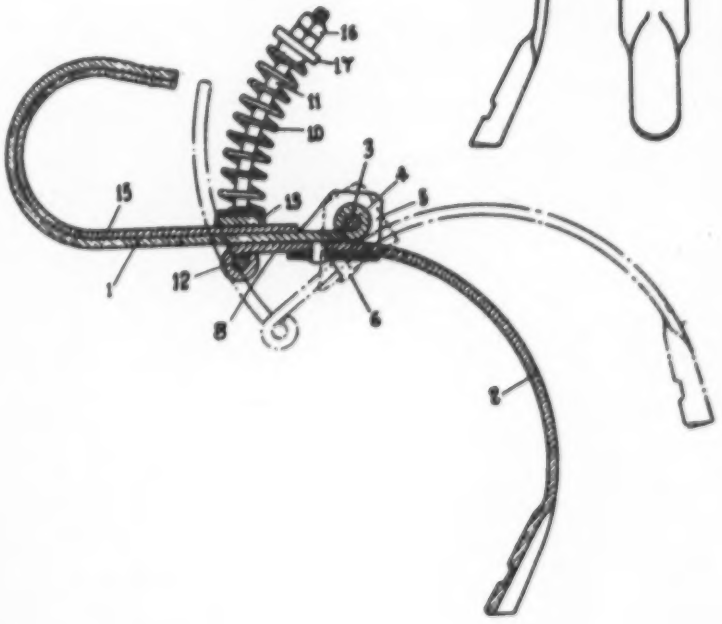


FIG. 3



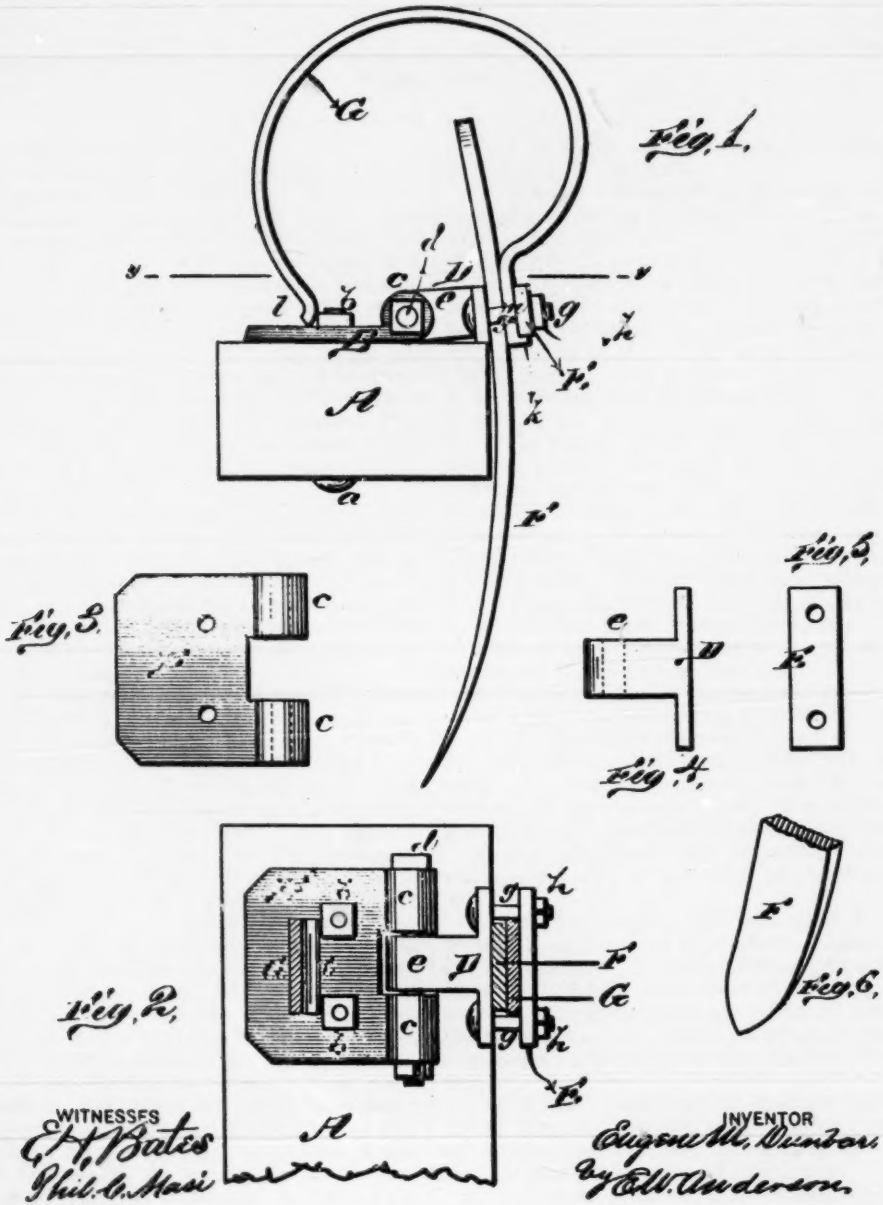
ADDITIONAL PATENTS CITED IN DEFENDANT'S ANSWER

745

E. M. DUNBAR.

Harrow.

No. 211,003. Patented Dec. 17, 1878.



WITNESSES

E. H. Bates

Phil. C. Masi

INVENTOR

Eugene M. Dunbar

by E. W. Anderson

ATTORNEY

747

UNITED STATES PATENT OFFICE

EUGENE M. DUNBAR, OF KALAMAZOO, MICHIGAN.

IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **211,003**, dated December 17, 1878; application filed June 1, 1878.

To all whom it may concern:

Be it known that I, EUGENE M. DUNBAR, of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented a new and valuable Improvement in Harrows; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of my improved harrow. Fig. 2 is a horizontal section of the same, taken through the line *y y* of Fig. 1; and Figs. 3, 4, 5, and 6 are details.

This invention has relation to harrows; and it consists in the construction and novel arrangement, with a harrow-tooth and spring, of the hinged shackle or clamp, forming a bearing in which said tooth is readily adjustable, and which is held down to its work by the pressure of the spring, all as hereinafter fully shown and described.

In the accompanying drawings, the letter A represents a beam of the harrow-frame, and B the base-plate of the hinged shackle or clamp, which is connected to the beam by means of bolts *a* and nuts *b*, the same bolts and nuts usually serving to fasten together the joints of the harrow-frame. The plate B is formed with two eyes, *c*, for the passage of the hinge-bolt *d*, whereby the knuckle *e* of the shackle-plate D is connected, forming the hinge-joint. The shackle-plate D is horizontally extended on each side of its knuckle, and is perforated, as shown, for the passage of the clamping-bolts *g*. These bolts extend through the rear clamp-plate, E, which is set up by means of the nuts *h* to hold the tooth F. This tooth is flattened from front to rear, and slightly curved, as shown. It is made without notches, holes, or projections, being smoothly finished on its faces and edges, so as to have all the strength of which the material is capable, to resist the strain and shocks to which it is subject in use. It is easily adjustable to cut at any desired depth by loosening the nuts in rear of the clamp-plate, setting the tooth, and then fastening the same by turning up the nuts.

G indicates the curved or C spring, which is employed to put the proper tension on the tooth, while allowing it to yield when striking stones or other obstructions in its path. It is preferably made in the loop or C form shown, being a plain steel band without notches, holes, or projections except the bearing-offsets *k l* at its ends. In this manner the entire elastic power of the spring is preserved, and it is rendered less liable to fracture under sudden strain. It is applied by fastening its heel *m* in the shackle between the tooth and the rear plate, E, the under edge of which is engaged by the end offset, *k*, of the spring, whereby the latter is secured from casual disarrangement. The spring is bowed over the upper end of the tooth, and its forward end engages with a bearing upon the base-plate B. Usually the nuts on the ends of the bolts by which this plate is secured to the beam will serve as a bearing for this end of the spring, as shown in the drawings.

The tooth applied in the manner above described will, when working, continually tremble, and thus more thoroughly pulverize the soil, and will also, when caught by any root, stone, or other obstruction, turn backward enough to let the tooth pass over such obstruction and immediately enter the soil again.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the tooth F and spring G, of the shackle or clamp, consisting of the front plate, D, having the hinge-knuckle *e* and a bolt-hole on each side thereof, the rear plate, E, having corresponding bolt-holes, the bolts *g*, and the nuts *h*, adapted to clamp said tooth and spring, substantially as specified.

2. A harrow-beam having the base-plate B bolted thereon, a tooth-shackle hinged to said base-plate, and a tension-spring bearing upon said tooth-shackle and said base-plate.

3. The combination, with a hinged shackle and a base-plate fixed to the harrow-beam, of the loop or C-spring G, bearing upon the

shackle and base-plate, and bowed over the tooth clamped in said shackle, substantially as specified.

4. The combination, with the hinged shackle, its rear plate, E, and the harrow-tooth, of the tension-spring having the offset *k*, engaging under the plate E, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

EUGENE M. DUNBAR.

Witnesses:

ROBERT E. HILL,

WILLIAM M. SHEAR.

(No Model.)

751

C. D. CARTER.

Spring Harrow Tooth.

No. 231,268. Patented Aug. 17, 1880.

Fig. 1.

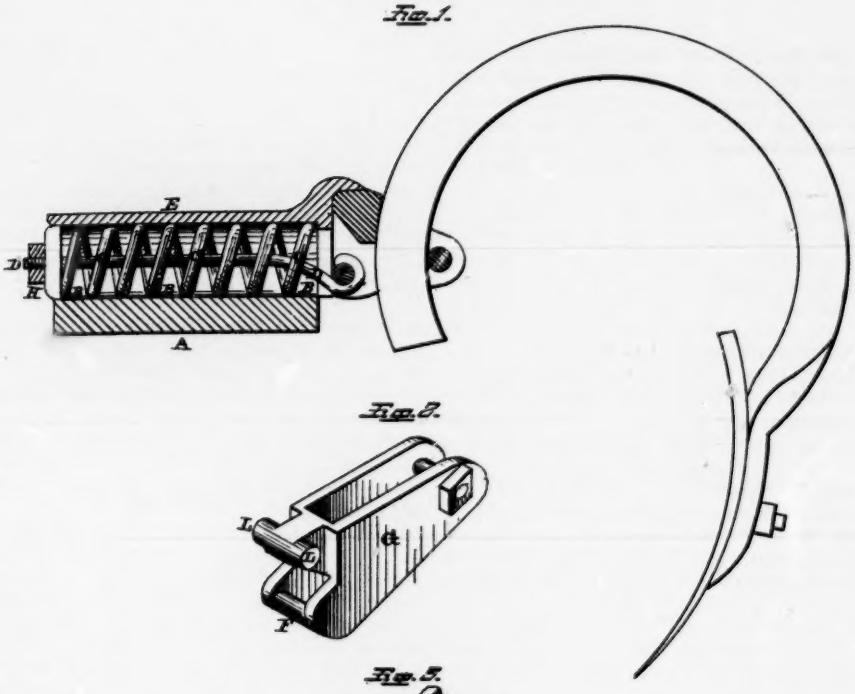
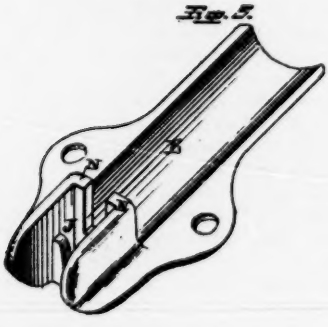


Fig. 2.

Fig. 3.



Witnesses:
W. W. Mortimer.
Wil. A. Kerr.

Inventor
Chas. D. Carter.
per
F. A. Lehmann, atty

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES D. CARTER, OF GRAND RAPIDS, MICHIGAN.

SPRING HARROW-TOOTH.

SPECIFICATION forming part of Letters Patent No. 231,268, dated August 17, 1880.

Application filed June 22, 1880. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. CARTER, of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Spring Harrow-Teeth; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in harrow-teeth; and it consists in a curved tooth which is passed through an opening in a pivoted holding-block that is placed in the frame, and which block has an adjustable spring secured to its inner end, whereby when any strain is brought to bear upon the tooth the spring is compressed and the block turns upon its pivot in the frame so as to allow the tooth to ride over an obstruction, as will be more fully described hereinafter.

The object of my invention is to provide each tooth with a spring tension device which will allow the tooth to give sufficiently when it catches against any obstruction in the ground to prevent the breakage of the tooth or the sudden stoppage of the team, as is always the case where the tooth is not provided with a device of this nature.

Figure 1 is a vertical section of my invention. Fig. 2 is a perspective of the block in which the tooth is held. Fig. 3 is a perspective of the iron frame.

A represents a beam of the harrow, which has a groove or recess, B, made in its face, so as to receive the coiled spring C. This spring C is placed around the screw-bolt D, and is held in between the beam A and the metal frame E, as shown.

The bolt D has a hook made on its rear end, so as to catch the part F of the block G, and has a screw-thread made upon its forward end, so that the tension of the spiral spring can be changed at will by means of the nut H. This nut projects beyond the front edge of the beam A, and is always in sight, and where a wrench or other device can be applied to it at any moment for the purpose of loosening or tightening the pressure of the spring. In order to center the forward end of this spring and have it always promptly acted upon by the nut, the centering-core is placed inside of the spring and over the bolt at the forward end of the spring, and against this core the nut always bears.

In the rear end of the frame there is made a socket, J, for the pivots L of the block to fit in, and just in the rear of these pivots are formed the two flanges N, against which the rear end of the spring presses, and between which flanges the rear end of the bolt passes for the purpose of catching over the spring-block. This block, being provided with pivots, as shown in Fig. 2, fits in the socket made in the rear end of the frame to receive it, and is held firmly in place by the pressure of the spring, its rear end bearing against the two flanges made in the frame.

When any strain is brought to bear upon the tooth the block turns upon its pivots sufficiently to allow the lower end of the tooth to either give before the pressure which is brought to bear upon it in such a manner that the tooth will not be broken or so that the tooth can ride over the obstruction without stopping the forward movement of the team. As soon as this tooth is released from the pressure the spiral spring instantly draws the block back into position again, and thus causes the tooth to again assume its position in the ground.

By means of the screw on the end of the screw-bolt, as already described, the tension of the spring can be so changed as to regulate the amount of pressure which is necessary to cause the tooth to bend backward before the obstruction.

By means of my invention harrows, drill-teeth, and other such agricultural implements can be drawn along with but little or no danger of being injured or stopping the forward motion of the team unless the teeth should happen to catch under an obstruction over which it is not possible for it to pass.

Having thus described my invention, I claim—

1. A spring tension device for harrow and drill teeth, consisting of a metallic frame having a socket in its rear end, a block which can turn upon its pivots, a screw-bolt, and a spiral

754

spring, the tooth being passed through the rear end of the pivoted block, substantially as shown.

2. The metallic frame having a recess to receive the coiled spring, a socket in its rear end to receive the pivoted block, and flanges against which the rear end of the spring bears, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of June, 1880.

CHARLES D. CARTER.

Witnesses:
GEO. W. THOMPSON,
WILLIS B. PERKINS.

(No Model.)

H. COBB.

HARROW.

No. 284,278. Patented Sept. 4, 1883.

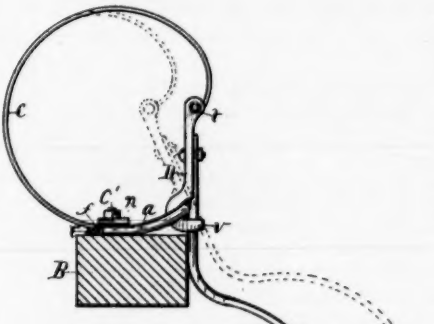


Fig. 1

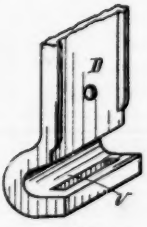


Fig. 2

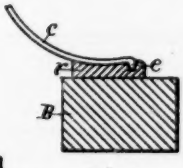


Fig. 4

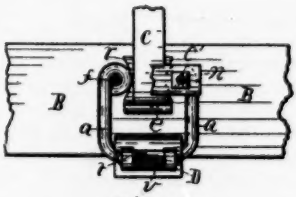


Fig. 3

Witnesses.
Ino C Perkins
Romine H Buckhout

Inventor.
Hiram Cobb
Per Lucius C West
Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

757

HIRAM COBB, OF KALAMAZOO, MICHIGAN.

HARROW.

SPECIFICATION forming part of Letters Patent No. 284,278, dated September 4, 1883.

Application filed June 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, HIRAM COBB, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented a new and useful Harrow, of which the following is a specification.

My invention consists in certain combinations of improved parts in that class of harrows which are provided with hinged spring-actuated shares.

In the drawings forming part of this specification, Figure 1 is a side elevation of a share and spring with the share-beam in cross-section; Fig. 2, a broken detached part in perspective; Fig. 3, a top view of Fig. 1 with the spring broken away, and Fig. 4 a cross-section on a line with the edge of the spring in Fig. 3.

The share or tooth P has an upper straight portion, as in former devices, connecting with a hinged tooth-support. The tooth-support D in the present device terminates at the lower end with an open hook or concave recess, *v*, the free end of which hook has an elongated opening or slot to receive the straight portion of the share. Such a tooth-support is more easily and cheaply made than former styles having hinging-eyes, which require a core in casting, and said support D can be readily connected and detached from the bail *a* by simply hooking and unhooking. The upper portion of the share, when coupled with the share-support D, as in Fig. 1, closes the open side of the hook or recess *v*, thus forming a hinging-eye for the hinging-bail *a*. The hinging-bail *a* has two eyes, through which the binding-bolts *n* are located. From these eyes the loop portion of the bail extends rearward and upward, thus bringing the hinge above the beams and freely allowing the hook *v* to be connected with said bail. Between said bail-eyes is located a seat, *r*, for spring *c*. It is concaved on top, and has a recess in the end to receive the hooked end *e* of the spring *c* to prevent the spring from slipping beneath the binding-plate *c'*. The sides of the seat *r* are concaved to fit around the eyes of the hinging-bail *a* to hold said seat in place. The spring *c* consists of a curved or bowed strip of spring metal. It is hinged to the share-support D at *t*. A more prompt and unvarying spring action is thus obtained, as a better purchase is exerted on the spring thus located and secured in position to be contracted. Such a construction and combination of simple parts greatly facilitates the construction and operation of this class of harrows.

Having thus described my invention, what I claim as new is—

1. The combination of a spring-actuated share with the hinging-bail and the share-support having the open slotted hook, said share and hook, when connected, forming a hinging-eye to said bail, substantially as set forth.

2. The combination of the share-support, the hinging-bail, the concaved seat having the end recess, the spring and binding-plate, the lower end of said spring provided with the hook and the upper end hinged to the tooth-support, all arranged substantially as described.

3. The share-support having the open hook, the share and the spring hinged to the upper end of said share-support and provided with the hook, in combination with the hinging-bail having the eyes and the upwardly-inclined loop, the concaved seat having the hook-recess, and the concave sides between the eyes of the hinging-bail and the binding-plate, substantially as specified and shown.

4. The combination of the hinged share-support having the open bail-hook, a connecting-share and hinging-bail, the concave spring-seat, and the spring having its lower end rigidly secured in said seat and its upper end hinged to said share or tooth-support, substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in the presence of two witnesses.

HIRAM COBB.

Witnesses:

ROMINE H. BUCKHOUT,

OSCAR K. BUCKHOUT.

(No Model.)

759

B. F. RIX.

HARROW.

No. 287,965. Patented Nov. 6, 1883.

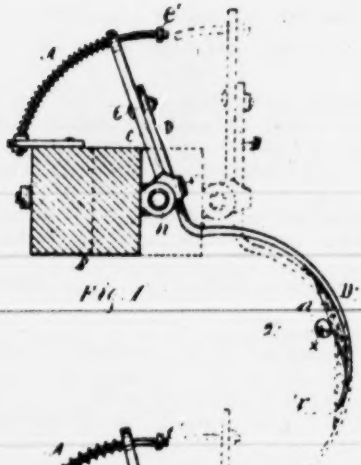


Fig. 1

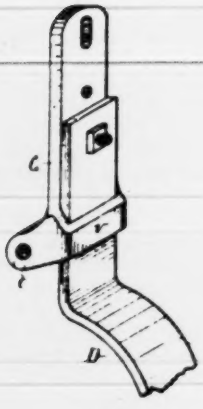


Fig. 3

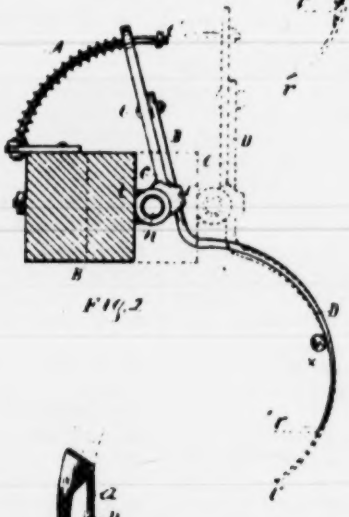


Fig. 2

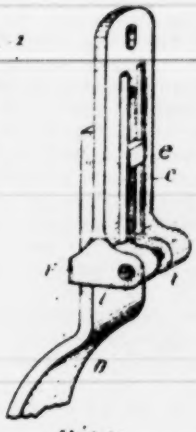


Fig. 4

Fig. 5

Witnesses.
Jno. C. Pilkins
John Jo. Chase

Inventor.
Benj. F. Rix
Per Lucius C. Hart
Atty.

UNITED STATES PATENT OFFICE.

BENJAMIN F. RIX, OF KALAMAZOO, MICHIGAN, ASSIGNOR OF ONE-THIRD TO MARY H. KIPP, OF SAME PLACE.

HARROW.

SPECIFICATION forming part of Letters Patent No. 287,965, dated November 6, 1883.

Application filed May 19, 1882. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. RIX, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented a new and useful Harrow, of which the following is a specification,

My invention has for its object certain improvements in harrow-teeth, and in the means for connecting them with the frame.

In the drawings forming a part of this specification, Figure 1 is a side elevation: Fig. 2, a side elevation of a differently-constructed tooth, introduced for the purpose hereinafter explained; Figs. 3 and 4, broken portions enlarged, showing a front and rear view in perspective; Fig. 5, a section on line 2 2 in Fig. 1 in perspective.

The hinged supporting-bar *c*, with which the tooth is connected, is made all in one piece—that is, the upright part, with which the tooth is connected by a bolt, *e*, is provided with an integrally-formed base consisting of the hinging-eyes *f f* and the loop *r*, which surrounds the tooth. The bar *c* is hinged to the frame B, in the usual manner, by bolt *s*. Such a construction is easily and cheaply made, compared with former tooth-supports, and the operation of connecting the tooth therewith greatly facilitated.

In constructing the tooth D a portion of the bow a little above the lower end is formed vertically concaved from the rear side, with the front edge or apex, *a*, of the convex side describing a straight line, Fig. 1, while the curved configuration of the edges remains the same throughout, as in a bowed tooth not having the improvement, Figs. 1 and 2. The lower or working end of the tooth is not convexed. The tooth receives its elastic effect from the spring on rod A. Many useful results are attained in the operation of such a tooth, aside from ease in draft and beneficial effects on the soil, a prominent one of which is that the tooth, when intercepting a root or obstruction, *x*, swings back and upward quicker and farther during a given movement of the harrow than a tooth having a like bow, Fig. 2, without the improvement in Fig. 1. The same forward movement of the harrow is shown in each of these figures, the dotted position showing the normal condition of the parts when at rest, with the tooth having just met the root *x*. Said root is located at the same vertical distance below the harrow-frame B. The difference in upward swing of the teeth is illustrated by the difference in distance between the dotted line at *r'* and the dotted end *r*.

When the harrow in each figure is moved on ahead, the tooth in Fig. 2 will hang to the root *x*, while the tooth in Fig. 1 will continue to swing up until the working end is met, when, owing to the angle of the bow at that time, it will readily pass over the root.

Having thus described my invention, what I claim is—

1. In a harrow, a tooth-support consisting of the flat upright portion, provided with a base integrally formed therewith, said base having the two lugs on one side horizontally perforated, and the loop on the other side having a vertical opening, substantially as set forth.

2. A bowed harrow-tooth having the convexed portion on the inner side of the bow, above the working end, the apex thereof describing a straight line, substantially as described.

3. A bowed tooth vertically concaved from the rear, above the working end, forming a convex portion on the inside of said bow, the apex of which is straight, while the curve of the edges of the bow is undisturbed, substantially as specified and shown.

In testimony of the foregoing I have hereunto subscribed my name in the presence of two witnesses.

BENJAMIN FRANKLIN RIX.

Witnesses:

JOHN H. CHASE,

N. O. NETEBROCK.

(No Model.)

743

G. MOORE.

SPRING TOOTH FOR CULTIVATORS.

No. 503,288. Patented Aug. 15, 1893.

Fig. 1.

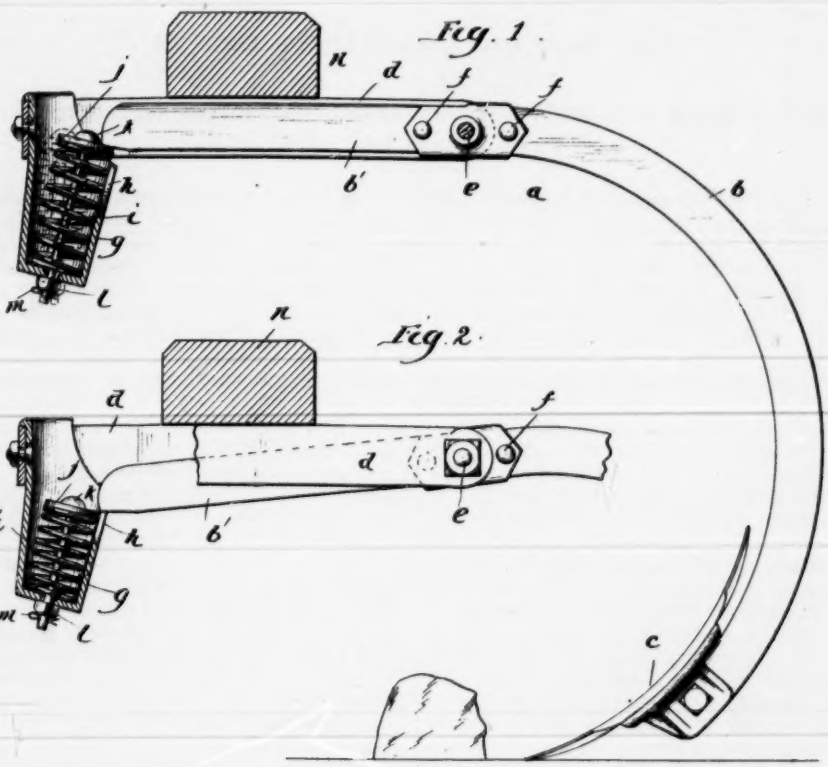
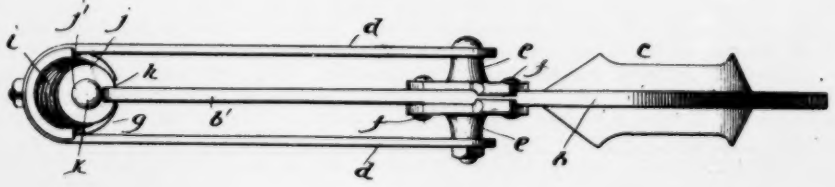


Fig. 2.

Fig. 3.



Witnesses:
Nellie M. Kibben.
Julia M. Bridd.

Inventor
Gilpin Moore
by Bond, Adams & Pickard.
Attorneys.

UNITED STATES PATENT OFFICE.

GILPIN MOORE, OF MOLINE, ILLINOIS, ASSIGNOR TO THE DEERE & COMPANY, OF SAME PLACE.

SPRING-TOOTH FOR CULTIVATORS.

SPECIFICATION forming part of Letters Patent No. 503,288, dated August 15, 1893.

Application filed June 10, 1892. Serial No. 436,259. (No model.)

To all whom it may concern:

Be it known that I, GILPIN MOORE, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Spring-Teeth for Cultivators and other Agricultural Implements, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the tooth, the pocket which holds the spring being in section. Fig. 2 is a similar view of a portion of the tooth, showing the position of the parts when the tooth strikes an obstruction; and Fig. 3 is a top view, with the supporting cross beam removed.

My invention relates to spring teeth adapted to be used upon cultivators or other similar farming implements. Heretofore in the construction of spring teeth there have been two varieties: first, those in which the spring of the tooth is inherent in the tooth or shank itself and is due to its own elasticity; and second, those having a joint furnished with an adjustable spring lock, which permits temporary movement under favoring circumstances. In the former, the tooth, when drawn through the soil to be cultivated, has a vibratory or tremulous motion, which greatly aids in pulverizing. In the latter, the spring lock holds the tooth rigidly to its position when drawn through the soil, until an obstruction is met with. Then the spring is unlocked, permitting the lower part of the shank to bend backward and pass the obstruction when the spring returns the shank to its original position and it proceeds rigidly as before in its pathway through the earth.

It is to be noticed that the function performed by each class of teeth is different. In the first, a vibratory pulverizing is effected, which is entirely absent in the second class. In the second class, the character of the work done is exactly the same as has always been accomplished by the common form of rigid tooth implements, the spring lock simply being added as a safety device, to prevent bending or breaking the shank. It is evident that when a tooth of the first described class meets with an immovable obstacle unless the machine is stopped at once the tooth will be more or less straightened. If this straightening force is greater than the limit of elasticity of the tooth, the tooth will either be broken or permanently straightened, thereby destroying or impairing the utility of the implement. The usefulness therefore of both classes is limited, the first by the elasticity of the tooth and the second by its inability to perform vibratory pulverizing.

No elastic tooth machine has heretofore been made with a safety device to prevent injury to the tooth when a solid obstruction is met, and no rigid tooth machine has yet appeared capable of doing the work of the elastic shank implements.

The principal object of my invention is to avoid the objections common to spring teeth as heretofore constructed, which I accomplish by providing a tooth having a rigid shank, which is given a spring action by the action of a separate spring. Another object of my invention is to improve in general the construction and operation of spring teeth. I accomplish these objects as hereinafter specified and as illustrated in the drawings.

That which I regard as new will be pointed out in the claims.

In the drawings,—*a* indicates a spring tooth, which consists of a rigid shank *b* bent to a suitable shape, and carrying on its lower end a shovel *c*. The shovel *c* may be of any suitable pattern, and may be secured to the shank *b* in any desired manner, or be made integral therewith. The shank *b* is trunnioned near its upper end in a yoke *d*, by trunnions *e*, as best shown in Figs. 1 and 3, so as to swing in a vertical plane. The trunnions *e* are rigidly secured upon opposite sides of the shank *b* by rivets *f*, and are arranged so that they will fit closely upon the shank, as best shown in Fig. 3. At the inner end of the yoke *d* is rigidly secured a pocket *g*, which depends therefrom, as best shown in Figs. 1 and 2. The pocket *g* is of about the shape of a frustum of a cone, the smaller end being at the bottom; and the bottom is inclined, as shown.

i, indicates a coil spring, which is mounted in the pocket *g*. By constructing the pocket *g* in the shape of a frustum of a cone and inclining the bottom of the pocket, as described,

the spring will lie in an inclined position and next to the inner wall of the pocket, as best shown in Figs. 1 and 2. The upper end may thereby be pressed away from the inner wall, for purposes which will appear hereinafter.

j, indicates a plate, which rests upon the upper end of the spring *i* and is held in place by means of a bolt *k* which passes downward through the spring *i* and the bottom of the pocket *g*, and is secured in place by means of a washer *l* and a key *m*, or in any other suitable manner. The plate *j* is of about the size of the spring *i*, as shown in the drawings.

h, indicates a slot formed in the upper end of the inner portion of the pocket *g*, for purposes which will appear hereinafter.

b', indicates a portion of the shank *b* which extends from the point at which the shank is trunnioned, nearly to the other end of the yoke *d*, its length being such that it will project a short distance beyond the inner edge of the pocket *g*. The extension *b'* is preferably formed integral with the main portion of the shank *b*, but it may consist of a separate piece rigidly attached thereto. The arrangement is such that when the shovel *c* is lifted, the inner end of the extension *b'* will move downward through the slot *h*, as indicated in Fig. 2. The under side of the extension *b'* is fitted at the end, to adapt it to bear squarely upon the plate *j*, and the upper portion of the end of the extension *b'* is rounded, as shown in Figs. 1 and 2.

n, indicates the cross beam of a cultivator gang, to the under side of which the yoke *d* is secured by clips or other suitable devices, in such manner that the downward motion of the extension *b'* of the shank *b* will not be prevented.

The operation of my improved tooth is as follows:—The position of the various parts is normally as shown in Fig. 1, the extension *b'* lying then in a horizontal position, its end bearing upon the plate *j*. When the cultivator shovel strikes an obstruction, the shovel *c* will be moved backward, when the extension *b'* will be thrown downward, compressing the spring *i* to the position shown in Fig. 2, when the extension *b'* will be clear of the plate *j* and will move downward through the slot *h*, permitting the shovel *c* to be raised the necessary height to pass over the obstruction. When the obstruction has been passed and the cultivator beam is raised, the weight of the shovel blade *c* aids in throwing the forward end of the extension *b'* in an upward direction into engagement with the spring pressed plate *j*, whereby the shovel *c* and the tooth *a* are returned to operative position by gravity which is very desirable and materially simplifies the machine. The upward movement of the extension *b'* will be limited by the beam *n*, or by a suitable stop if the beam is omitted or elsewhere located. When the cultivator is in operation, the action of the spring *i* upon the extension *b'* will give to the shovel a tremulous or vibratory motion, which will greatly aid in pulverizing the earth, substantially as is the case with spring teeth in which the springiness is due to the inherent elasticity of the teeth. When the shank *b* and extension *b'* are made integral with each other, as hereinbefore suggested, instead of providing two separate trunnions *e*, *e*, as shown in the drawings, a single pin passing through the shank and secured therein may be used, in which case the arms or bars of the yoke *d* may be brought nearer together than they are shown in Fig. 3. The rearward incline of the bottom of the pocket or spring case *g* constantly tends to throw the upper end of the spring backward, so that when the forward extension of the tooth bar is brought up to position, the spring will pass under it and will remain under it without being jarred out of position.

One of the principal characteristics of my improvement is the employment of a spring, which will have all of the uses of a spring in giving the tooth a vibratory action when in use, and in permitting the tooth bar to escape from the spring when under severe strain or pressure. Other means than the tilting bottom to the box or case *g* may be used for throwing the upper end of the spring under the end of the bar *b'*, such as a second spring, but the construction shown is that which I prefer.

That which I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a pivoted tooth shank, of a spring normally acting upon said shank to hold it in an operative position and to impart to it a tremulous motion when traversing the soil, said spring being adapted to be thrown out of operation under extraordinary backward pressure upon said shank, substantially as described.

2. The combination with a pivoted tooth shank, of a stop acting normally to hold said shank in operative position and to be thrown out of operation to permit said shank to swing under extraordinary backward pressure thereupon, said shank and stop being adapted to return by the action of gravity into engagement with each other to bring said shank to its operative position after the pressure is removed, substantially as described.

3. The combination with a yoke or support, of a tooth shank *b* pivoted to the yoke or support and having the extension *b'* in front of its pivot, and a spring trip located beneath the front end of the said extension for causing a tremulous motion of the tooth shank and releasing the forward extension thereof under extraordinary back pressure on said tooth shank, substantially as described.

4. The combination with a pivoted tooth shank, of a spring trip located under the forward end of said shank in front of the pivot thereof for holding the shank normally in operative position, said spring trip being moved out of engagement with the shank by extraordinary back pressure on said shank and the

latter being returned by gravity to its normal position when the back pressure is removed, substantially as described.

5. The combination with a yoke and a rigid tooth shank pivotally mounted therein, and adapted to swing in a vertical plane, said shank having an extension b', of a spring stop under said extension for holding the tooth in operative position under normal pressure, said stop being adapted to be disengaged from said extension under extraordinary pressure to permit the tooth to swing freely, substantially as described.

6. The combination with the swinging shank b, having extension b', of devices for supporting said shank, and a spring i under the end of the extension b', the upper end of said spring being inclined toward said extension, and being adapted to be pressed away therefrom, substantially as and for the purpose specified.

7. The combination with the swinging shank b, having extension b', of the yoke d, pocket g, having an inclined bottom and sides, slot h in said pocket, and spring i, substantially as and for the purpose specified.

8. The combination with the swinging shank b, having extension b', of the yoke d, pocket g, having an inclined bottom and sides, slot h in said pocket, spring i, plate j, rod k and key m, substantially as and for the purpose specified.

GILPIN MOORE.

Witnesses:
C. H. POPE,
J. E. POOLE.

769

D. J. LAMPRELL & F. COOK.

CULTIVATOR.

APPLICATION FILED SEPT. 4, 1913.

1,141,804. **Patented June 1, 1915.**

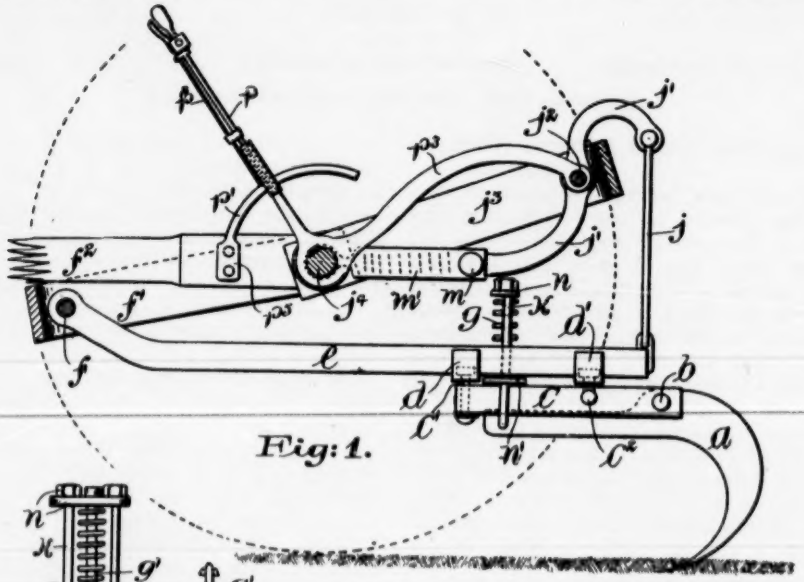


Fig: 1.

Fig: 3.

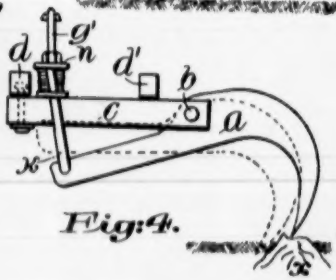


Fig: 4.

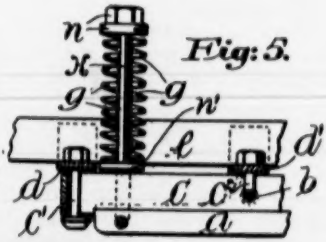


Fig: 5.

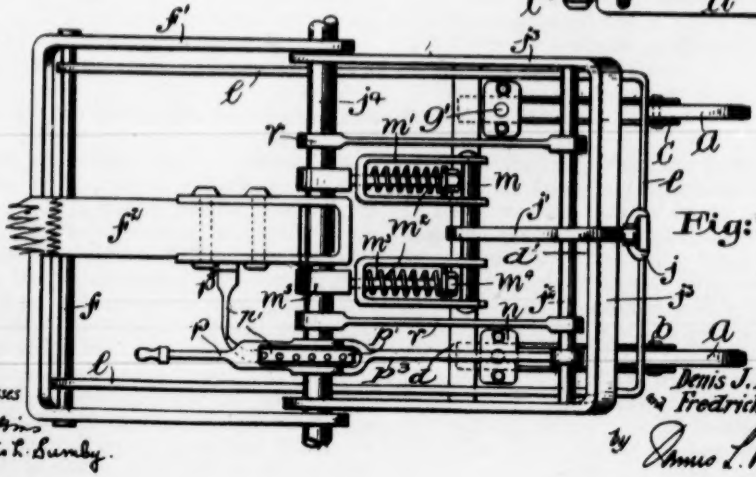


Fig: 2.

Witnesses
Norris L. Lumby.

Inventors
Denis J. Lamprell
Fredrick Cook,
by James L. Norris.

UNITED STATES PATENT OFFICE.

DENIS JOHN LAMPRELL AND FREDRICK COOK, OF DOWERIN, WESTERN AUSTRALIA, AUSTRALIA.

CULTIVATOR.

1,141,804. Specification of Letters Patent. Patented June 1, 1915.

Application filed September 4, 1913. Serial No. 788,169.

To all whom it may concern:

Be it known that we, DENIS JOHN LAMPRELL and FREDRICK COOK, both subjects of the King of Great Britain, and residing at Dowerin, Western Australia, Commonwealth of Australia, have invented certain new and useful Improvements in Cultivators, of which the following is a specification.

This invention relates to improvements in cultivators, and it embodies the use and provision of a pressure spring for each separate pivoted tine, and, also, a pressure spring or springs for each section of tines, the latter springs being employed to impart flexibility to the frame. The object of said springs is to cause or urge the tines, either separately or conjointly as a group or gang, to the working position immediately after passing over an obstacle, and, also, to urge the tines to their work and to maintain them at a uniform depth.

The invention will now be explained with the aid of the annexed drawings, in which—

Figure 1 is a side sectional elevation of the improved cultivator showing the application of one of the pressure springs to a tine and, also, to the frame carrying said tine. Fig. 2 is a plan view. Fig. 3 is a rear end view of one of the tines and its carrier bracket. Fig. 4 is a detail showing, in full lines, the passage of the tine over an obstacle, and, in dotted lines, the normal position of the tine. Fig. 5 is a detail showing the manner of securing the tine-carrier bracket to the frame.

In said figures a indicates one of the tines, of which there may be any number, as will be understood. This tine is pivoted at b to its carrier bracket c, which latter also acts as a guide to insure correct working of the tine. The said carrier bracket c is U-shaped and is secured to the cross-bars d and d^1 of the U-shaped frame e, the cross-bars mentioned extending across said frame and having their ends turned upward and suitably secured to the side members of said frame. The front end of said bracket c is secured to the cross-bar d by the bolt c^1, and the central portion thereof is secured to the other cross-bar d^1 by an inverted T-bolt c^2, whose head is riveted through the side cheeks of the bracket. The frame e, at its front end, is pivoted on the cross-bar f, which latter forms part of the main frame f^1 and is rigidly attached to the draft pole f^2 of the cultivator.

Each tine a is provided with its own pressure spring g, which is suitably guided on the rod g^1 and operatively held in the U-shaped bridle piece K, the latter having a suitable tension adjustment device n, here shown as consisting of a pair of nuts and a head plate. The connecting or bottom portion of this bridle passes through the tine a, and its arms pass through the foot plate n^1, as shown clearly in Fig. 3, the tension of spring g operating as between the adjustment device n and the foot plate n^1, which latter is mounted on the carrier bracket c.

The front of the frame e is pivoted to the cross-bar f, and is suspended at its rear end by the link j from an arm j^1, said arm being pivoted on the cross-bar j^2 of the secondary frame j^3 of the cultivator. Frame j^3 is rigidly connected to the main axle j^4. Arm j^1, at its other end, is connected to the cross-bar m carrying the bridles m^1 in which the spiral springs m^2 are tensionally held on the pins m^3 by the nuts m^4. The pins m^3 extend through openings in the forward ends of the bridles m^1 and have their heads m^5 hingedly connected to the axle j^4 of the cultivator, such connection serving to impart rigidity and firmness of action to the bridles and their contained tension springs m^2. These springs m^2 act to exert pressure upon the frame as a whole, in the same way as the springs g upon the tines.

When the tine meets an obstacle x, as seen in Fig. 4, its rear portion is forced to rock upward on its pivot b toward the stay bar d^1 of the frame e, while the downward movement of its front end contracts the spring g.

The pressure springs m^2 of the frame, as also the springs g of the tines, are set to the approved normal working tension by means of the nuts m^4 and the adjustment devices n, respectively, and the said springs m^2 are also controlled as a whole by the single lever p, which is keyed on the axle j^4 and retained in any position by the usual notched quadrant p^1 and pawl p^2, the quadrant being rigidly secured at p^3 to the draft pole f^2. The lever p, by its arm p^4, is operatively connected to the cross-bar j^2 carrying the arm j^1, whereby said arm j^1 and connected members and parts are operated. This lever p, while controlling all the tines

of the cultivator together, allows each tine independence of action, and it also sets the depth of cut for the tines by pressing frame *e* downward by means of the arm j^1 and link *j*, while each separate tine is kept to its work by its spring *g*. Each tine is controlled by its own spring *g*, and if such spring prove insufficient to allow the tine to rise and pass over the obstacle, then the springs m^2 respond to the pressure and allow the whole frame *e* to rise sufficiently high to clear said obstacle. Any number of strengthening bars r^1 may be used, these bars being keyed to the axle j^4 and also to the cross-bar j^3. They act and move in unison with the lever *p* and are auxiliary to the frame j^3.

We claim:—

1. In a cultivator, the combination of a frame provided with a cross-bar; a horizontal guide bracket rigidly secured to said bar; a tine pivoted intermediate its ends to said bracket; and a pressure spring for normally holding the front end of said tine in raised position.

2. In a wheeled cultivator, the combination of a cultivator frame; an axle to which said frame is connected; a rearwardly-extending arm carried by said axle; a second frame pivotally connected at its front end to said cultivator frame and suspended at its rear end from said arm; and resilient devices for normally holding said second frame in lowered position.

3. In a wheeled cultivator, the combination of a cultivator frame; an axle to which said frame is connected; a longitudinally-arranged arm fulcrumed intermediate its ends in the cultivator frame; a second frame pivotally connected at its front end to the cultivator frame and suspended at its rear end from the rear end of said arm; and resilient means connected to the front end of said arm for normally holding said second frame in lowered position.

4. In a wheeled cultivator, the combination of a cultivator frame; an axle to which said frame is connected; a rearwardly-extending arm carried by said axle; a longitudinally-arranged arm pivotally connected intermediate its ends to the rear end of the first-named arm; a link suspended from the rear end of the second-named arm; a second frame pivotally connected at its front end to the cultivator frame and having its rear end connected to said link; and resilient connections between said axle and the front end of the second-named arm for normally holding said second frame in lowered position.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

DENIS JOHN LAMPRELL.
FREDRICK COOK.

Witnesses:
JOHN MCPHERSON,
R. H. LEESON.

773

May 19, 1931. J. H. ROBERTS 1,805,599

COTTON CHOPPING ATTACHMENT FOR CULTIVATORS

Filed March 8, 1930

Fig. 1.

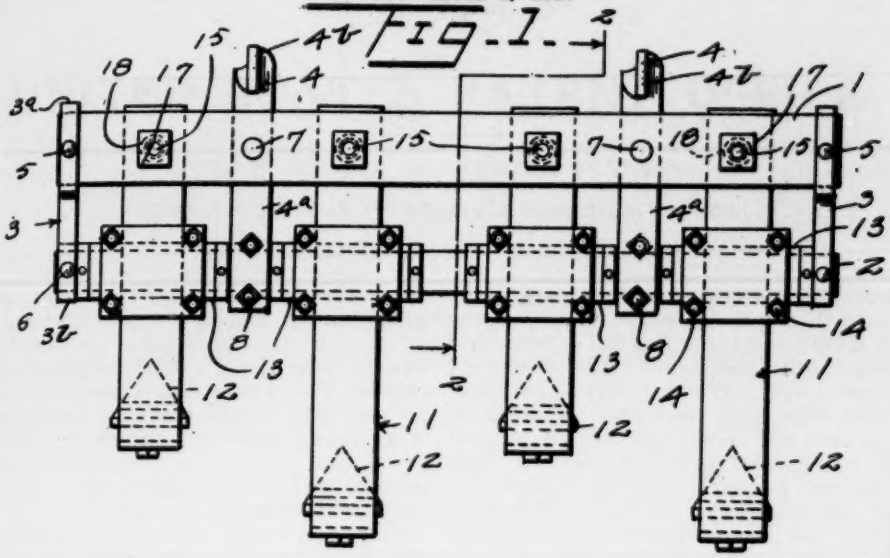


Fig. 2.

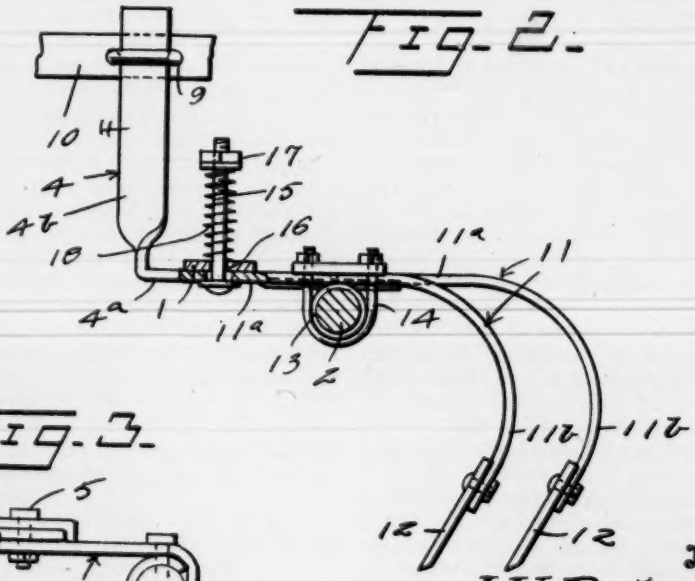
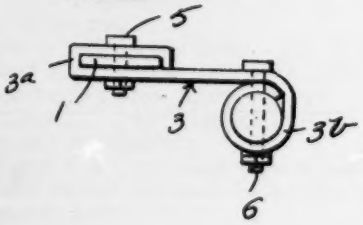


Fig. 3.



Inventor

J. H. Roberts

By Watson E. Coleman

Attorney

Patented May 19, 1931 1,805,599

775

UNITED STATES PATENT OFFICE

JOHN H. ROBERTS, OF HATFIELD, ARKANSAS

COTTON CHOPPING ATTACHMENT FOR CULTIVATORS

Application filed March 8, 1930. Serial No. 434,285.

This invention relates to cotton choppers, and more particularly to a cotton chopping attachment for cultivators.

The invention has for one of its objects to provide a novel, simple and highly efficient cotton chopping attachment which shall be adapted to be readily connected to a riding or walking cultivator.

To attain the foregoing and other objects, the nature of which will appear as the description proceeds, the invention comprehends the provision of a cotton chopping attachment which shall embody a frame, means adapted to secure the frame to a cultivator, standards equipped with chopping hoes and connected to the frame for independent pivotal movement thereon, and means yieldingly holding the standards against pivotal movement with respect to the frame.

The invention further comprehends the provision of a cotton chopping attachment wherein the frame shall embody a bar and a shaft, wherein the means for connecting the frame to a cultivator shall embody brackets having horizontal arms fixed to the bar and shaft and vertical arms adapted to be secured to the cultivator, and wherein the hoes standards shall be pivotally mounted upon the shaft with their front ends arranged beneath the bar, and wherein the means for yieldingly holding the standards against pivoted movement shall embody rods carried by the standards and passing freely through the bar and springs bearing on the bar and against the rod.

The invention is hereinafter fully described and claimed, and illustrated in the accompanying drawings, wherein:

Figure 1 is a top plan view of the cotton chopping attachment;

Figure 2 is a sectional view taken on the vertical planes indicated by the line 2—2 of Figure 1, and

Figure 3 is a view in end elevation of the frame of the cotton chopping attachment.

The cotton chopping attachment comprises a bar 1 and a shaft 2 of which the latter is located in rear of the former. The bar 1 and shaft 2 are connected at their ends by links 3 and the bar, shaft and links provide a frame of elongated rectangular contour in plan and adapted to be connected to a cultivator by brackets 4. The links 3 are provided at their front ends with rectangular loops 3^a for the reception of the ends of the bar 1, and are provided at their rear ends with circular loops 3^b for the reception of the ends of the shaft 2. Bolts 5 passing through the bar 1 and loops 3^a and bolts 6 passing through the shaft 2 and loops 3^b, secure the bar, shaft and links 3^b in assembled relation, the bolts 6 holding the shaft against rotation. The brackets 4 have horizontal arms 4^a which rest upon the bar 1, shaft 2 and are secured to the bar by bolts 7 and to the shaft by clamps 8. The brackets 4 also have vertical arms 4^a adapted to be secured by bolts 9 to any suitable parts of a cultivator. The brackets 4 are arranged between the links 3 and the transverse center of the frame, and their horizontal arms 4^a strengthen and reinforce the frame at the points where it is connected to the cultivator. The brackets 4 may be secured to those parts of a cultivator to which the gang bars are secured, one of such parts being diagrammatically shown and designated 10.

Standards 11 having straight portions 11^a and curved portions 11^b, are secured to the frame through the medium of their straight portions which have their front ends arranged at the under side of the bar 1 and rest at points intermediate their ends upon the shaft 2. The standard portions 11^b extend downwardly and forwardly and are provided at their lower ends with blades 12. The attachment may be provided with any desired or required number of the blade carrying standards 11. The standard portions 11^a are of such length as to arrange the blades 12 in front and rear rows.

The standards 11 are rockably supported upon the shaft 2 by bearing sleeves 13. The standard portions 11^a rest upon the bearing sleeve 13, and are secured thereto by U-bolts 14. As the front ends of the standards 11 contact with the under side of the bar 1, the rocking movement of the standards is limited to a direction which will permit the blades 12 to move upwardly and rearwardly and the

blades will move in this direction when they encounter stones or the like obstructions. The standards 11 are provided at their front ends with upwardly extending rods 15 which pass freely through openings 16 in the bar 1 and are provided at their upper ends with nuts 17. Springs 18 are mounted on the bolts 15 between the bar 1 and nuts 17, and serve to yieldingly hold the standards 11 against rocking movement.

The attachment may be readily connected through the medium of brackets 4 to a riding or walking cultivator, and will, when in use, chop or cut down every other stand of cotton. It may also be used for the purpose of plowing in oats, plowing level land and tearing down ridges. It is strong and durable, and may be manufactured and sold at a comparatively low cost.

While I have described the principle of the invention, together with the structure which I now consider the preferred embodiment thereof, it is to be understood that the structure shown is merely illustrative and that such changes may be made, when desired, as fall within the scope of the invention as claimed.

I claim:—

1. A cultivator attachment of the character set forth, comprising a frame embodying a front bar and a rear shaft, attaching brackets secured to the frame, standards having straight front portions and curved rear portions, the straight standard portions extending across the shaft and having their front ends positioned in contact with the rear side of the bar and the rear portions of the standard extending downwardly and forwardly, blades secured to the lower ends and the rear portions of the standards, means rockably connecting the standards to the shaft, and means cooperative with the bar and standards to yieldingly hold them against rocking movement.

2. A cultivator attachment of the character set forth, comprising a frame embodying a front bar and a rear shaft, bearing sleeves rotatably mounted on the shaft, standards having straight front portions and curved rear portions, the front standard portions resting upon the sleeves and having their front ends arranged in contact with the under side of the bar and the rear standard portions extending downwardly and rearwardly, blades secured to the lower end of the rear standard portions, means securing the front standard portions to the bearing sleeves, bolts secured to the front ends of the front standard portions and extending upwardly through the bar and provided at their upper ends with nuts, and coil springs arranged upon the bolts between the bar and nuts.

3. A cultivator attachment of the character set forth, comprising a bar provided with openings, a shaft located rearwardly of the bar, links connecting the terminals of the bar and shaft, brackets having vertical and horizontal portions and having their horizontal portions secured to the bar and shaft, bearing sleeves rotatably mounted upon the shaft, standards having straight front portions and curved rear portions, the standard front portions resting upon the bearing sleeves and having their front ends contacting with the lower side of the bar and the standard rear portions extending downwardly and forwardly, means securing the front standard portions to the bearing sleeves, bolts secured to the front ends of the front standard portions and extending upwardly through the openings in the bar and provided at their upper ends with nuts, coil springs surrounding the bolts between the bar and nuts, and plates secured to the lower ends of the rear standard portions.

In testimony whereof I hereunto affix my signature.

JOHN H. ROBERTS.

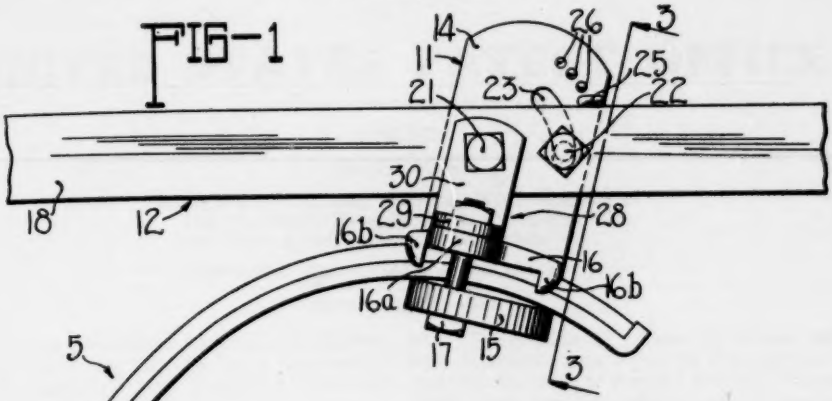
777

Dec. 4, 1934. T. J. ERDMAN 1,982,862

CULTIVATOR

Filed May 3, 1933

FIG-1



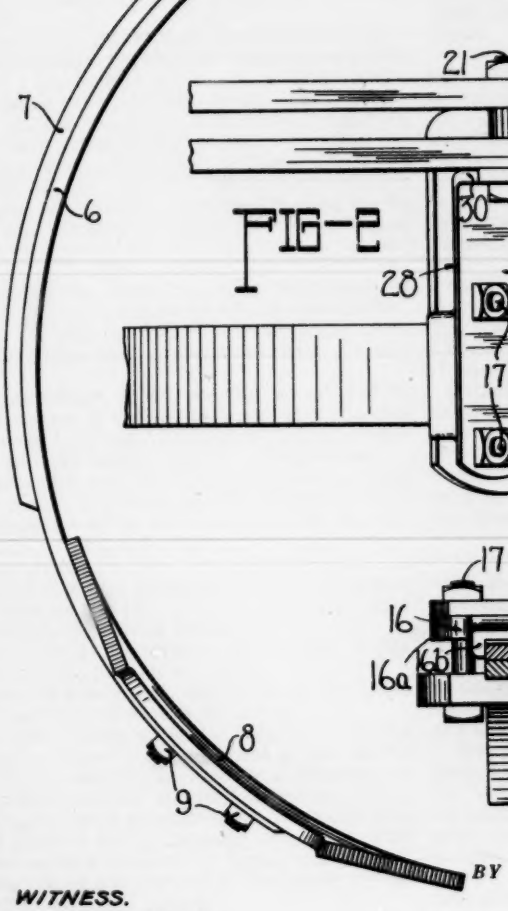


FIG-2

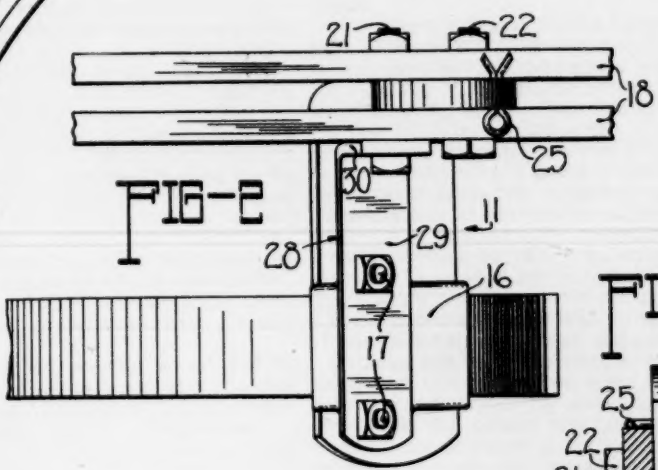
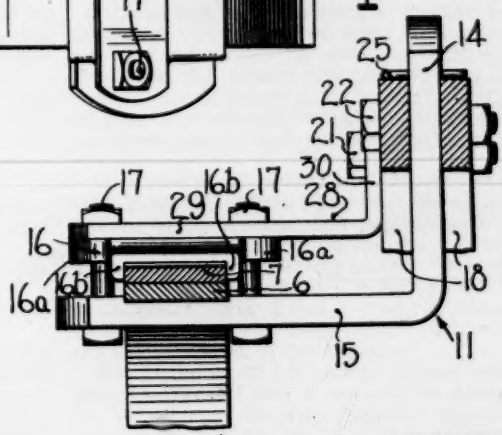


FIG-3



INVENTOR
Theodore J. Erdman

BY
E. C. Boff
ATTORNEY

WITNESS.
Edward Melin.

Patented Dec. 4, 1934 1,982,862

579

UNITED STATES PATENT OFFICE

1,982,862

CULTIVATOR

Theodore J. Erdman, Horicon, Wis., assignor to The Van Brunt Manufacturing Company, Horicon, Wis., a corporation of Wisconsin

Application May 3, 1933, Serial No. 669,149

4 Claims. (Cl. 97—198.1)

My invention pertains to spring tooth cultivators and relates particularly to a connecting bracket connecting a spring tooth to a cultivator drag bar.

The principal object of my invention is to provide a connecting bracket which may be connected to a drag bar in such a manner as to be easily and readily adjusted to vary the depth of penetration of the spring tooth and to securely hold the spring tooth in the desired adjusted position.

Another object of my invention is to provide a frangible member for the connecting bracket which may be adjusted to engage the drag bar in any of the adjusted positions of the connecting bracket to normally assist in holding the bracket in the desired adjusted position, but which is capable of shearing when the spring tooth engages an unyielding object so as to release the bracket, thereby allowing the tooth to swing away from the obstruction and prevent breakage to the tooth.

Another object is to provide a connecting bracket having means between the drag bar and spring tooth to strengthen the connecting bracket and to hold the spring tooth in rigid position.

Other objects and advantages of my invention will be apparent to those skilled in the art after a consideration of the following detailed description, taken in conjunction with the accompanying drawing wherein:

Figure 1 is a side elevational view of a spring tooth and a section of a drag bar and illustrating my improved connecting bracket;

Figure 2 is a fragmentary plan view of the structure shown in Figure 1; and,

Figure 3 is a sectional view taken on the plane of the line 3—3 of Figure 1.

The spring tooth, which is referred to in its entirety by numeral 5, comprises a flat spring steel shank 6 bent in the form of a letter C. A short reinforcing leaf 7, also constructed of flat spring steel, is bent to conform to the upper portion of shank 6 and is disposed in contact with the outer surface thereof. A double-pointed soil engaging shovel 8 is secured to the lower end of shank 6 by means of bolts 9.

The spring tooth 5 is clamped to a connecting bracket 11 which in turn is adjustably connected to a drag bar 12. The connecting bracket 11 is formed of an angle member and comprises a vertical leg 14 and a horizontal leg 15. The upper end of tooth 5 is clamped to the horizontal leg 15 by means of a clamping plate 16 and a pair of clamping bolts 17 extending upwardly through holes provided in leg 15 and in laterally extending ears 16a in plate 16. Plate 16 is also provided with depending lugs 16b at its four corners which embrace the sides of shank 6 and leaf 7 to prevent them from twisting relative to the connecting clamp.

The drag bar 12 comprises a pair of beam members 18 arranged in spaced parallel relation to receive therebetween the vertical leg 14 of bracket 11. The leg 14 is adjustably connected to beam members 18 by an attaching bolt 21 and a clamping bolt 22. The attaching bolt 21 is disposed in aligned holes in beam members 18 and leg 14 and serves as a pivot upon which bracket 11 is turned to adjust it from one position to another. The clamping bolt 22 extends through holes in beam members 18 and through an arcuate slot 23 provided in vertical leg 14 and serves to clamp beam members 18 against leg 14 to hold bracket 11 in the desired position. The arcuate slot 23 is formed concentric with bolt 21 so that bracket 11 may be adjusted without removing bolt 22.

A break pin 25 is provided in vertical leg 14, to contact with the upper edges of beam members 18 and serves to assist in holding the bracket in the desired position. A plurality of holes 26 are provided in vertical leg 14 and are adapted to receive the break pin 25, the pin being inserted in the hole adjacent the upper edges of beam members 18.

The break pin 25 should be of sufficient strength to withstand the strain of normal operating conditions, which is occasioned in drawing tooth 5 through the soil, but which will shear when the tooth engages an unyielding object. This affords protection against breakage to spring tooth 5 and its associated parts. I find that an ordinary small cotter pin serves effectively for the break pin 25, and such is shown in the drawing.

The spring tooth 5 is usually spaced laterally from drag bar 12 and is mounted on horizontal leg 15 adjacent the end thereof. Due to the pressure of the soil on tooth 5 a considerable strain is directed to leg 15, which may at times become so excessive as to bend the leg causing tooth 5 to assume a tilted position. In order to strengthen bracket 11 so as to maintain tooth 5 in a proper position, an angle brace 28 is provided between drag bar 12 and tooth 5. The angle brace 28 comprises a horizontal leg 29 and a vertical leg 30. The horizontal leg 29 is secured to the top of clamping plate 16 by bolts 17 and vertical leg 30 is held in contact with the outer face of the adjacent beam 18 of drag bar 12 by attaching bolt 21. By reason of brace 28 being spaced appreciably from bracket 11, the two

together form somewhat of a bridge-like construction which is effective to resist distortion in all directions.

What I claim is:

1. In a cultivator, a drag bar comprising a pair of spaced beams, an L-shaped bracket having a vertical leg and a horizontal leg, the vertical leg being clamped between said beams and said horizontal leg extending laterally to one side of said drag bar, an L-shaped brace having a vertical leg fixed to the outer face of one of said beams and a horizontal leg extending laterally in parallel spaced relation to the horizontal leg of said bracket, a spring tooth having its upper end disposed between the outer ends of said horizontal legs, and means for rigidly clamping said spring tooth and said horizontal legs together, said means comprising a clamping plate disposed between one of said horizontal legs and said spring tooth and having a lug on each side engaging the sides of said spring tooth, and a pair of bolts disposed on opposite sides of said spring tooth and extending through aligned perforations in said horizontal legs and said clamping plate, said spaced horizontal legs forming a bridge-like construction for resisting distortion of the bracket.

2. In a cultivator, a drag bar comprising a beam, an L-shaped bracket having a vertical leg and a horizontal leg, the vertical leg being clamped to one side of said beam and said horizontal leg extending laterally to one side of said beam, an L-shaped brace having a vertical leg fixed to the opposite side of said beam and a horizontal leg extending laterally in parallel spaced relation to the horizontal leg of said bracket, a cultivating tool having its upper end disposed between the outer ends of said horizontal legs, and means for rigidly clamping said tool and said horizontal legs together including a clamping plate having lugs engaging the sides of said tool, said spaced horizontal legs with said clamping means forming a bridge-like construction for resisting distortion of the bracket.

3. In a cultivator, a drag bar comprising a beam, an L-shaped bracket having a vertical leg and a horizontal leg, the vertical leg being clamped to one side of said beam and said horizontal leg extending laterally to one side of said beam, an L-shaped brace having a vertical leg fixed to the other side of said beam and having a horizontal leg extending laterally in parallel spaced relation to the horizontal leg of said bracket, a cultivating tool having its upper end disposed between the outer ends of said horizontal legs, and means for rigidly clamping said tool and said horizontal legs together, said spaced horizontal legs with said clamping means forming a bridge-like construction for resisting distortion of the bracket.

4. In a cultivator, a drag bar comprising a beam, a ground engaging tool, a supporting bracket for said tool, a bolt extending through aligned holes in said beam and said bracket by which said bracket is pivotally connected to said beam, a second bolt extending through a hole in said beam and a slot in said bracket arcuate about said first bolt as a center, and a break pin disposed in a hole in said bracket and engaging said beam and cooperating with said bolts to prevent rotation of said bracket about said first bolt, but permitting such rotation when an obstruction is encountered by said tool.

THEODORE J. ERDMAN.

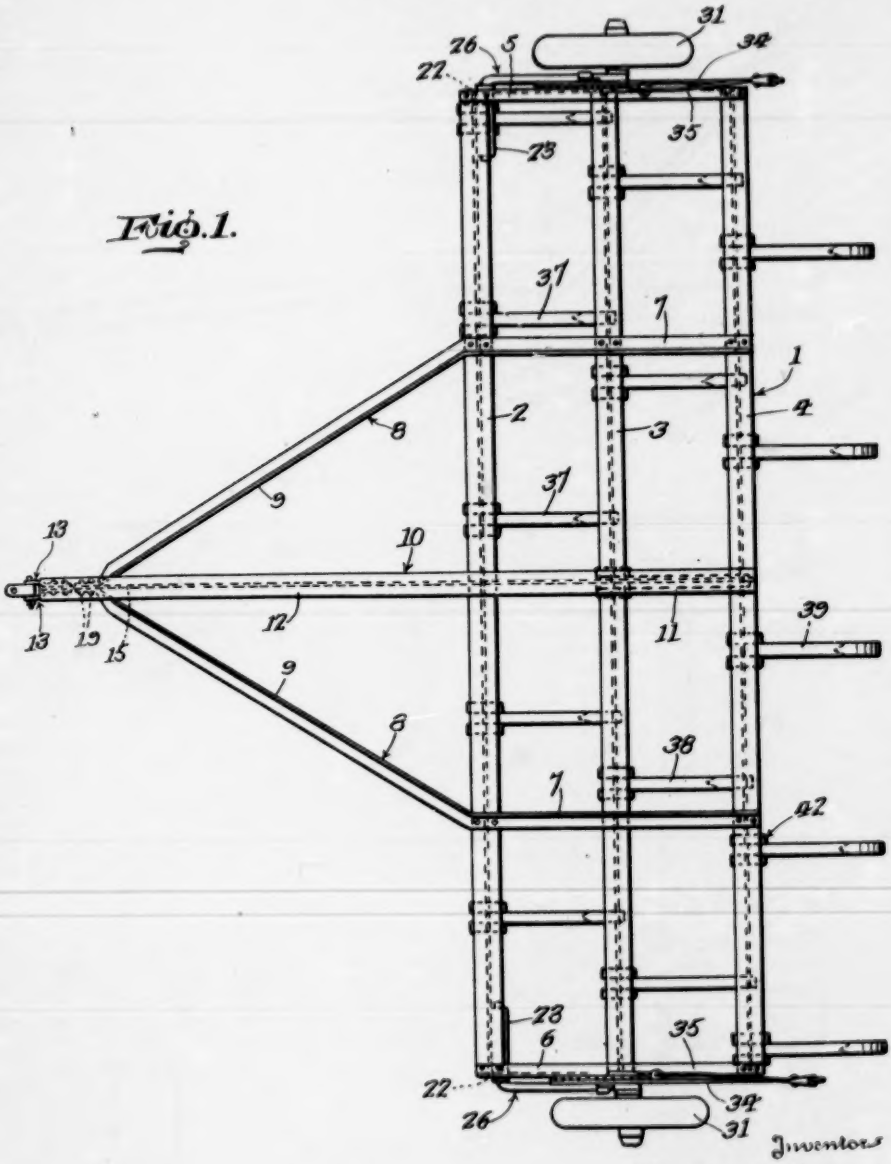
781

Jan. 28, 1936. I. H. NOELL ET AL 2,029,249

MOBILE GROUND WORKING DEVICE

Filed June 1, 1935 2 Sheets-Sheet 1

Fig. 1.



Inventors
Isome H. Noell
Fred W. Hoeme

By Geo. P. Kimmel
Attorney

783

Jan. 28, 1936. I. H. NOELL ET AL 2,029,249

MOBILE GROUND WORKING DEVICE

Filed June 1, 1935 2 Sheets-Sheet 2

Fig. 2.

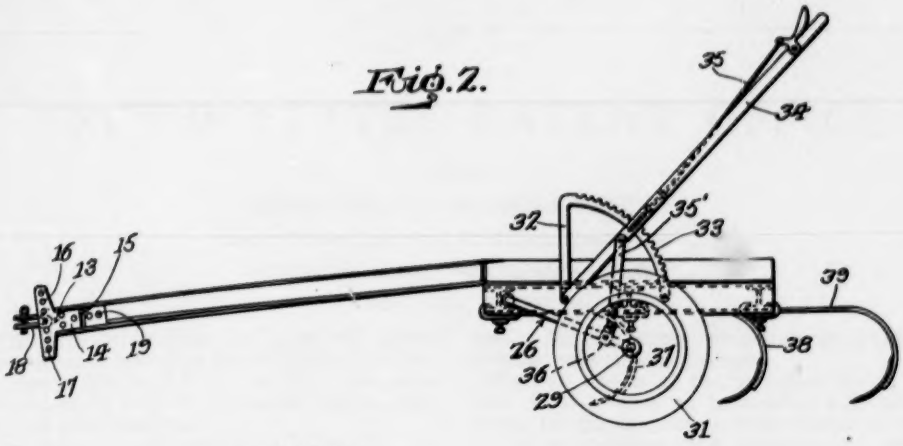
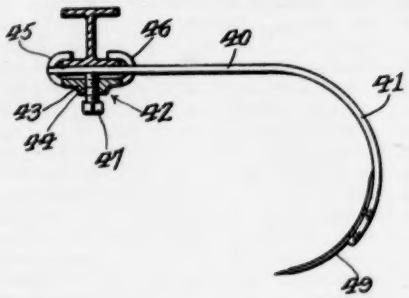


Fig. 3.



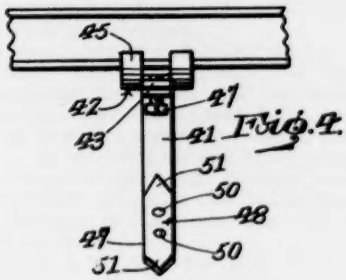


Fig. 4.

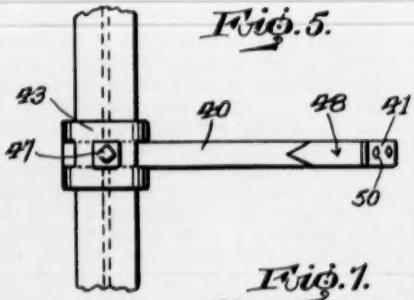


Fig. 5.

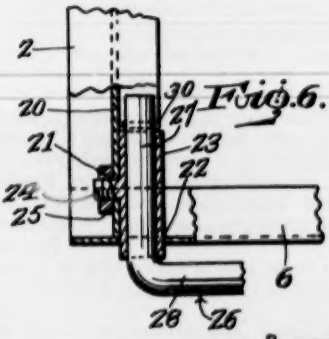


Fig. 6.

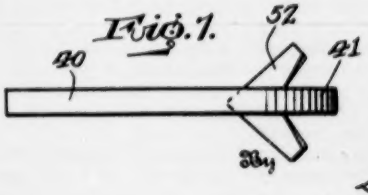


Fig. 7.

Inventors
Isome H. Noell
Fred W. Hoeme

By Geo. P. Kimmel
Attorney

Patented Jan. 28, 1936 2,029,249

785

UNITED STATES PATENT OFFICE

2,029,249

MOBILE GROUND WORKING DEVICE

Isome H. Noell and Fred W. Hoeme, Hooker, Okla.

Application June 1, 1935, Serial No. 24,553

1 Claim. (Cl. 97—198.1)

This invention relates to a mobile ground working device such as a shovel, plow or cultivator and is adapted for use in either preparing the ground for crop or cultivating and protecting crop after planting.

The object of the invention is to provide, in a manner as hereinafter set forth, a thoroughly efficient device of the class referred to for stirring, digging out and throwing up a moist and heavier sub-soil that is not eroded and dry to create a ridged surface of a corrugated nature to avoid wind erosion and to form a sub-surface to gather and preserve moisture; for acting upon the land to insure fertilization thereto and to provide a mixture of soils when the land is combined of sand loam surfaces, clay or similar subsurface soils; for mixing and stimulating the soils when the soils and sub-soils are of a like nature; for acting upon the land to create deep sub-surfaces and surface ridges to protect the land from soil erosion, either by wind or water.

A further object of the invention is to provide, in a manner as hereinafter set forth, a ground working device for efficient use on ordinary prairie land, wheat, corn, cotton or other row-crop where standard rows of crop are to be planted, or land prepared for planting or when cultivation of land is desired that is planted, or when cleaning, cultivating and weeding of growing crop is desired; as well as to cultivate, stir and ridge sub-soil and clean the ground; for throwing up spaced ridges on the surfaces of the field to prevent soil erosion, either by water or wind; and creating sub-surface furrows of any desired depth that tends to catch and attract drainage of surface moistures to be retained in such sub-surface furrows, thus preserving and checking the sub-drainage on flat or rolling land.

A further object of the invention is to provide, in a manner as hereinafter set forth, a device of the class referred to including a cushioned mobile structure provided with resilient curved beams for supporting and carrying the ground working tools.

A further object of the invention is to provide, in a manner as hereinafter set forth, a device of the class referred to including vertically adjustable traction wheels of the cushioned type for supporting the body or frame of the device to which the beams for the ground work tools are attached.

A further object of the invention is to provide, in a manner as hereinafter set forth, a device of the class referred to including a set of resilient beams carrying ground working tools and means for adjustably connecting the beams of each set to a support therefor.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a device for the purpose set forth which is simple in its construction and arrangement, strong, durable, compact, thoroughly efficient in use for the purpose intended thereby, conveniently repaired, readily assembled and comparatively inexpensive to manufacture.

With the foregoing and other objects in view which may hereinafter appear, the invention consists of such parts and such combination of parts as will be specifically referred to and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a top plan view of the device,

Figure 2 is a side elevation thereof,

Figure 3 is a side view of the form of resilient beam employed for carrying a ground work tool and further showing the means for clamping the beam to the body part of the device,

Figure 4 is a front elevation of the beam as anchored and carrying a ground working tool,

Figure 5 is an inverted plan view of the beam as anchored and carrying a grounding tool,

Figure 6 is a fragmentary view in plan illustrating the coupling connection between the traction wheel hanger and the body part of the device, and

Figure 7 is a top view of the beam having attached thereto a modified form of ground working tool.

The device includes a flat, rectangular body part 1 of frame-like form including front, intermediate and rear body bars 2, 3, 4 respectively and a pair of side bars 5, 6. The bars 2, 3, 4 are in the form of I-beams, of like length and are arranged in parallel spaced relation. As is well known, an I-beam includes two opposed spaced parallel pairs of oppositely extending flanges and a web, and with the web merging into the said pairs of flanges. The I-beams employed in the body part 1 are disposed to provide a pair of oppositely extending flanges at their tops and bottoms. The bars 5, 6 are in the form of channel irons, overlap the top and bottom of, are suitably connected to and are of less length than that of bars 2, 3, 4.

Mounted upon the bars 2, 3, 4, between the transverse median and each end thereof, is the

rear part 7 of an angle bar 8. The forward part of the latter, indicated at 9, extends at an inclination towards the transverse median of body part 1. The bars 8 are oppositely disposed. The bars 8 are suitably secured to the top of body part 1. The bars 8 brace body part 1 and also act as bracing means for a hitch 10 consisting of a rear part 11 and a forward part 12. The hitch 10 is in the form of an I-beam. The part 11 is mounted upon and suitably secured to the body part 1 at the transverse median of the latter. The forward part 12 of hitch 10 is disposed at a downward inclination (Figure 2) with respect to rear part 11 and has arranged at and extending forwardly from its outer end a pair of parallel apertured spaced T-shaped members 13. The stems 14 of members 13 are arranged against opposite sides of and secured to the web 15 of hitch 10. The heads 16 of members 13 have superposed aligning apertures 17 for adjustably connecting thereto a clevis 18. The forward ends of the parts 9 of the bars 8 are secured to opposite sides of and in proximity to the forward end of web 15 by the holdfast means 19.

The web of bar 2 is indicated at 20 and is provided, in proximity to each end thereof, with an opening 21. Only one of the openings 20 is shown and in this connection see Figure 6. The bars 5, 6, in proximity to their forward ends, are provided with openings 22. Arranged against the rear face of web 20 are spaced endwise aligning sleeves 23 which project from the ends of bar 2. The sleeves 23 are formed with forwardly extending peripherally threaded protuberances 24, only one shown, which pass through openings 21 in web 20. Engaging with the protuberances 24 and abutting web 20 are securing nuts 25 which clamp sleeves 23 against web 20. The sleeves 23 provide bearings for oppositely disposed wheel hanger 26 of like form. Each hanger includes a horizontally disposed inner arm 27 and a rearwardly directed downwardly inclined outer arm 28 terminating in an outwardly directed axle or spindle 29 disposed at right angles to arm 28. The arms 27 are rotatably mounted in and are of greater length than that of the sleeves 23. The arms 27, in proximity to their inner ends, carry stop pins 30 disposed diametrically and extending laterally in opposite directions therefrom. The pins 30 coact with the inner ends of sleeves 23 for coupling the hangers 26 to the body part 1. Mounted on the axles or spindles 29 are traction wheels 31 of the cushioned tired type. The wheels 31 are retained on the axles 29 by any suitable means.

The arms 27 of the hangers 26 are vertically adjustable for the purpose of elevating and lowering the wheels 31 to vary the distance between body part 1 and the ground. The arms 27, when adjusted, are latched in such position with body part 1. For this purpose the side bars 5, 6 have secured thereto the lower ends of vertically disposed bars 32 terminating at their upper ends into rearwardly extending upstanding quadrant-shaped racks 33 anchored at their lower ends to bars 5, 6. Pivotally mounted at their lower ends, upon the securing means for the bars 32, are upstanding rearwardly extending adjustable hand levers 34 carrying pawl and lever mechanisms 35 for coaction with the racks 33 for the purpose of latching levers 34 in adjusted position. Pivotally connected to the levers 34 are the upper ends of depending links 35' which are pivotally connected at their lower ends to yokes 36 fixed to the arms 27.

Adjustably connected to the bars 2, 3, 4 are sets 37, 38, 39 respectively of rearwardly directed lengthwise adjustable resilient beams or tool standards. Each beam is of like form and consists of a resilient strap of metallic material formed of a horizontal disposed straight upper part 40 terminating into a depending rear part 41 of arcuate curvature. The beams of a leading set are staggered with respect to the beams of a follower set. A clamping device 42 is employed for connecting the forward end terminal portion of the part 40 of a beam to a body bar 2, 3 or 4 and which may be positioned at any desired point lengthwise of the bar. Each clamping device 42 includes a base 43 having an axially arranged vertically disposed threaded opening 44, a pair of spaced horizontally disposed semi-oval shaped clamping arms 45 at the front of the base 43, a pair of spaced horizontally disposed semi-oval shaped clamping arms 46 at the rear of the base 43, and a vertically adjustable clamping screw 47 engaging with the wall of opening 44. The base 43 is in the form of a rectangular plate having its lengthwise edges aligned with the lengthwise edges of the base flanges of a body bar. The arms 45 are directed forwardly with respect to base 43 and the forward base flange of a body bar and then rearwardly inturned to overlap such flange. The arms 45 are directed rearwardly with respect to base 43 and the rearward base flange of a body bar and then forwardly inturned to overlap the said rear base flange. The upper portion of the arms 45 are oppositely disposed with respect to the upper portion of the arms 46, that is to say, the upper portion of the arms 45 extend rearwardly and the upper portion of the arms 46 extend forwardly. When a beam is secured to a bar 2, 3 or 4, the forward end of the upper part 40 of the beam is passed between the arms of the pairs of clamping arms and positioned between base 43 and bottom of the body bar. This arrangement of beam is had after the clamping device has been mounted upon the oppositely extending base flanges of the body bar. When part 40 has been arranged in the position stated, the clamping screw 47 is screwed home whereby the beam is tightly clamped against the lower face of the body bar, and in this connection reference is had to Figure 3.

The ground working tools shown in Figures 1 to 5 are of the same construction and indicated at 48. Each tool 48 performs a plowing function and is formed from a strap 49 of metallic material corresponding in width to that of part 41 of a beam. The strap 49 is of arcuate curvature and has its upper portion seated against the lower portion of the forward face of part 41. The lower portion of strap 49 extends forwardly from the lower end of part 41. The strap 49 is secured to part 41 by countersunk holdfast means 50. The upper and lower ends of strap 49 are tapered, as at 51.

Sweeps 52 (Figure 7) may be attached to the beams 37, 38, 39 instead of shovels, plows or diggers for use in shallow work, weeding, etc.

The adjustable spring beams to which the ground working tools are attached are such that either end of the plow may be used. The spring beams are adjustable forward and rearward in the clamps according to the soil being worked—the full length extension being more desirable and practical in hard or tight land and the shorter adjustment being best suitable for light or loose soil (ordinarily such principle would be the reverse with any other kind of plow) as the long adjust-

ments permit individual position of the tool in hard ground when contacting sub-surface rocks, harder streaks of dirt, etc., causing each to rise slightly, shift and dodge in the contact of such objects without in any way interferring with the other spring beams and tools by reason of the quality of steel in the beams, the heavy balanced weight of the frame and the submerged tools on the other spring beams in the soil, thus the whole prevents any side draft of the whole machine. Experience in economy of operation shows ground can be gone over with this set of tools as much as three times at the same expense of once over with the common one-way plow now in use in the Western country, being only a surface plow.

Each clamping arm is an integral continuation of a side edge of the base 43. Each clamping arm includes a lower stretch which merges at its inner end into an edge of the base 43 and merges at its outer end into the lower end of an upstanding inwardly directed curved bend. The upper end of the bend merges into the outer end of an inwardly extending upper stretch overlapping and slidable upon a base flange. The inner edges of the bends of each pair of arms provide abutments for the edges of the upper end terminal portion of the beam carrying the ground working tool.

What we claim is:

In a ground working device, a mobile I-beam, a resilient beam having a horizontally disposed part and a part depending from the rear end of the horizontally disposed part for carrying a ground working tool, said horizontal part extending rearwardly from said I-beam and having a portion thereof positioned transversely of the bottom of the I-beam, a base member arranged against the lower face of the said portion and being formed with a vertically disposed opening having a threaded wall, oppositely disposed upstanding clamping means at the front and rear of said base member and overlapping the lengthwise edges of the base flanges of said I-beam, and adjustable means threadedly engaging with the wall of said opening, abutting said portion and coacting with said clamping means for clamping said horizontal part against the bottom flanges of the I-beam, the said clamping means at the front and at the rear of said base member being in the form of a pair of spaced parallel curved arms of like form, the inner side edges of the arms of each pair abutting the lengthwise edges of said horizontal part.

ISOME H. NOELL.
FRED W. HOEME.

789

Department of Patents.
Patents Act 1903-1921.
Commonwealth of Australia.

No. 1056/26.

APPLICATION DATED
19th March, 1926.

LIBRARY JUN 15 1927 PATENT OFFICE

Applicant (Actual Inventor) ... ... RUSSELL PRIOR.
Application and Provisional Specification ... Lodged 19th March, 1926.
Application and Provisional Specification ... Accepted 9th April, 1926.
Complete Specification ... ... Lodged 18th December, 1926.
Complete Specification Accepted 19th *Mar.*, 1927 Acceptance Advertised (Sec. 50) 29 Mar., 1927

Class 30.9.

Drawing attached.

COMPLETE SPECIFICATION.

"Stump jump mechanism for cultivating implements."

I, RUSSELL PRIOR, of 73 Schutt Street, Newport, near Melbourne, in the State of Victoria, Commonwealth of Australia, Agricultural Implement Maker, hereby declare this invention and the manner in which it is to be performed to be fully described and ascertained in and by the following statement:—

This invention relates to stump jump mechanism for cultivating implements and has been devised in order to provide mechanism for this purpose which is of greater utility than that at present in use.

The invention is specially applicable to the stump jump tynes of a combined cultivator and seed drill and has for its object the provision of cheap, simple and efficient mechanism, the tyne being so connected that a rigid or stump jump connection can be effected in a rapid manner.

The essential features embodied in the invention are as follow:—

1. Means whereby the tyne can be rapidly interchanged from stump jump to rigid or vice versa in a rapid and convenient manner.

2. The provision of a guide block mounted on the shaft to form a guide for the tyne in its stump jumping movement.

3. The provision of means for permitting the adjustment of the tyne.

C.4661.—7/4/27.—100.—Price, 1s. 6d. post free.

4. The arrangement of a substantially long adjusting or set screw adapted to bear against the washer or cap at the top of the spring to enable the set screw on adjustment to bear on the spring to force it down into extreme compression to form a substantially rigid connection for interchanging the mechanism from stump jump to rigid, the screw also functioning to increase or decrease the spring pressure on the tyne.

5. The arrangement of the spring connections so that they are readily detachable to allow a solid block to replace said spring for the purpose of interchanging from stump jump to a rigid fitting.

In order to more readily understand the invention reference will now be made to the accompanying drawings in which:—

Figure 1 is a view in side elevation of the invention.

Figure 2 is an end elevation thereof, and

Figure 3 is a front elevation.

According to this invention the usual transverse squared shaft 5 is passed through a plurality of blocks 6 preferably of cast or mild steel, each block being adapted to form a tyne support.

Each block 6 is preferably set adjustably on the square shaft 5 by set screws 7 which pass through a short bar 8, and at its forward end in front of and below the squared

shaft the block 6 is formed to receive the pivot pin or bolt 9 of the tyne 10.

The tyne 10 is bent loosely around the pivot pin or bolt 9 and is suitably returned as at 11, thus strengthening the tyne 10 at this point.

The tyne 10 from the pivot 9 extends rearwards and downwardly at an angle and curves away from the block 5 towards the ground level 12 in the usual way and is fitted with a hoe 13.

Each block 5 is constructed to form a guide for the vertical movement of the tyne 10 in its stump jumping movement, and at the rear 14 below the normal level of the tyne a rest pin 15 is fitted to limit the downward movement of the tyne 10.

Each block 5 is adapted to receive a spiral spring 16, the upper end of which is provided with a cap or washer 17 against which a set screw 18 passing through a plate 19 held between bolts 20 is adapted to bear, thus providing means for varying the tension on the spring 16 and consequently the flexbility of the tyne 10.

The lower end of the spring is received by a stud 21 on the tyne 10 on its up-and-down movement, so ensuring that the spring 16 is always in a vertical or approximately vertical position.

Holes 22 are provided in the plates forming the guide 5, said holes being adapted to receive pins which support the tyne 10 and by this means the tyne is raised or lowered at its pivot, thus enabling the hoe 13 to meet the ground at the desired angle.

When it is desired to make a rigid tyne fitting the set screw 18 can be screwed down hard on the spring 16, the coils of which would seat one on the other pressing the tyne 10 down on the rest pin 15 and so make a rigid connection and prevent the vertical movement of the tyne 10.

Alternately the spring 16 can be readily removed and a rigid block or bar can be suitably disposed between the bar 19 and the tyne 10.

Having now fully described and ascertained my said invention and the manner in which it is to be performed, I declare that what I claim is:—

1. Stump jump mechanism for cultivating implements characterized by the use of a guide member adjustably positioned on a bar, said guide member receiving a tyne which is pivotted between plates forming said guide, means for permitting the vertical rising of the tyne, means for preventing said tyne falling below a predetermined position and means for maintaining said tyne normally in contact with the ground.

2. Stump jump mechanism for cultivating implements comprising spaced plates forming a guide for a pivotted tyne, a slot in said plates adapted to receive a squared bar, a stop beneath the tyne, a spring above the tyne and below a bar retained in the plates by bolts or the like, a set screw passing through said plate and engaging with the spring, holes in the plates to receive pins for adjusting the tyne, the whole being arranged and operating as herein set forth.

Dated this 18th day of December, A.D. 1926.

SIDNEY HENDLEY,
Patent Attorney for Applicant.

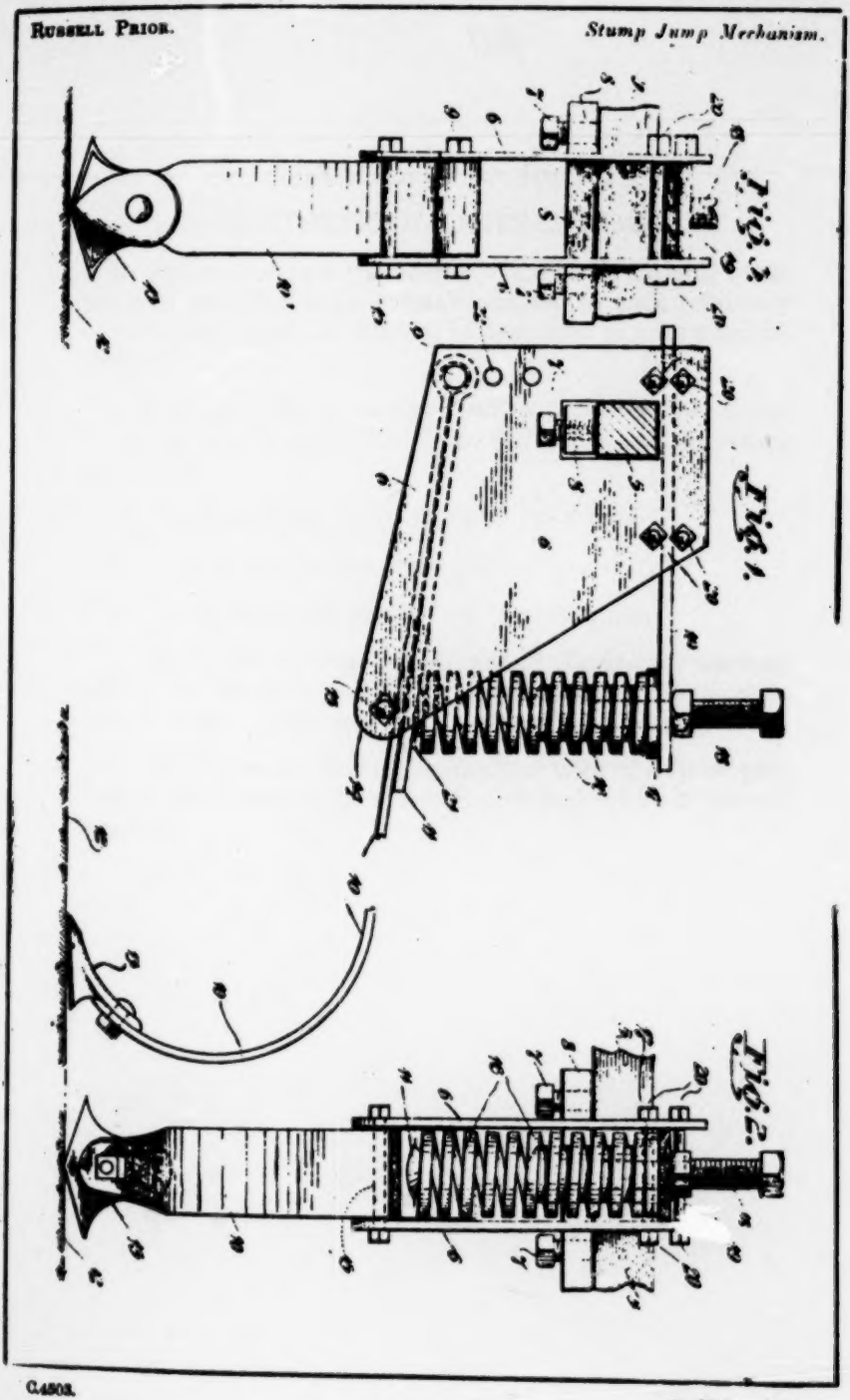
Witness—Amy F. Uhlhorn.

Printed and Published for the DEPARTMENT OF PATENTS, COMMONWEALTH OF AUSTRALIA, by H. J. GREEN, Government Printer for the State of Victoria.

19 Mar., 1926. AUSTRALIA. No. 1056/26.

RUSSELL PRIOR.

Stump Jump Mechanism.



C.4503.

One litho. sheet.

DEFENDANT'S EXHIBIT 7

HYPOTHETICAL GENERAL CLAIM

In a plow having a transverse frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction,

a mounting for attaching and supporting the shank of the ground working tool from the frame, said mounting including

1. a part adapted to be fixed to the frame,

2. a pivot pin on the fixed part,

3. a movable part pivoted on the pivot pin,

4. means for attaching the shank of the ground working tool to the movable part so that the shank and the movable part will pivot together around the pivot pin, and

5. spring means having connection with the fixed part and shank to permit the shank to rock and return to normal position.

DEFENDANT'S EXHIBIT 8A

CLAIM 1 FROM 798 FILE WRAPPER

In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction,

a mounting for attaching and supporting the shank of the ground working tool from the frame including

1. a part adapted to be fixed to the frame, and

2. a part pivotally mounted on the fixed part and having a plate portion extending forwardly from said pivotal mounting along an end portion of the shank and in movable engagement with the fixed part,
means on the pivotal part embracing the end portion of the shank, and

3. resilent means interconnecting said parts and engaging the end portion of the shank to hold the pivotal part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the pivotal part to move away from the fixed part along said end portion of the shank and back to normal position with said plate portion in contact with the fixed part

DEFENDANT'S EXHIBIT 8D

CLAIM 7 FROM THE 798 FILE HISTORY

In a plow having a frame and a ground working tool provided with a shank adapted to rock relatively to the frame when the plow is in operation in a forward direction,

a mounting for attaching and supporting the shank of the ground working tool from the frame including

1. a part adapted to be fixed to the frame and having

   a. spaced apart depending flanges to from a downwardly opening way to receive an end portion of the shank and having

   b. spaced apart ears extending rearwardly in substantially aligning registry with said flanges,

2. said mounting also including a movable part having

   a. a transverse ear between said spaced apart ears of the fixed part and having

   b. a shank engaging portion extending in said way,

3. a pivot pin extending through said spaced and transverse ears for pivotally connecting the movable part with the fixed part,

4. means connecting the end portion of the shank to the shank attaching portion, and

5. resilient means connecting said parts to hold the movable part in yielding contact with the fixed part so that when the shank is rocked the end portion of the shank will cause the movable part to move downwardly within said way along with said end portion of the shank and back to contact with the fixed part.